

ST. LOUIS DISTRICT HISTORIC PROPERTIES MANAGEMENT REPORT NO. 42

**A PHASE 1 ARCHAEOLOGICAL SURVEY FOR
HISTORIC PROPERTIES WITHIN THE SWAN LAKE,
HABITAT REHABILITATION ENHANCEMENT PROJECT (HREP)
ENVIRONMENTAL MANAGEMENT PROGRAM, (EMP),
POOL 26, ILLINOIS RIVER, CALHOUN COUNTY, ILLINOIS**

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Report describes results of a Phase I Archaeological & geomorphological investigation of 95 ac. within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP) construction area, located in Pool 26, Illinois River (mile 5.0-13.0, right bank) Calhoun Co. Il. Project involves construction of a levee, 5 borrow areas, 3 pump stations & 2 boat ramps w/ parking lots. Geomorphological investigation found recent alluvium deeper than construction impacts cover much of the area. In some areas where construction will go below the recent alluvium, buried soils were identified and further investigated. Two archaeological sites were investigated. Prehistoric (Woodland) Persimmon site (11-C-152) was determined eligible and recommended for mitigation. Buried site 11-C-212 contained prehistoric (eligible) & historic (ineligible) components. The prehistoric component will be avoided. Project clearance in regard to cultural resources is recommended. Survey was conducted in October, 1994 by American Resources Group, Lt., for the U.S. Army Corps of Engineers, St. Louis District on Corps lands managed for waterfowl by the Ill. Dept. of Nat. Resources & the U.S. Fish and Wildlife Service. The HREP is part of the Environmental Management Program (EMP) established to enhance & rehabilitate the Upper Mississippi River system.

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Final Report

St. Louis Historic Properties
Report No. 42

A Phase I Archaeological Survey for Historic Properties
Within the
Swan Lake Habitat Rehabilitation Enhancement Project (HREP),
Environmental Management Program (EMP)
Pool 26, Illinois River, Calhoun County, Illinois

Contract No. DACW43-93-D-0514
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Prepared for

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St. Louis District
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ABSTRACT

This report describes the results of a Phase I archaeological and geomorphological investigation of a 95 acre area within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP) construction area, located in Navigation Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right bank), Calhoun County, Illinois. The project area consists of the construction corridors of a proposed exterior levee, a relocated road, a drainage swale, and a pump station access road, as well as the proposed locations of five borrow areas, three pump stations and associated channels, two boat ramps and associated parking lots and access roads, and the two (land) ends of an interior closure. This research was carried out by American Resources Group, Ltd., Carbondale, Illinois, for the St. Louis District, U.S. Army Corps of Engineers, under the terms of a subcontract with Harland Bartholomew & Associates, Chesterfield, Missouri.

The results of the geomorphological investigation indicate the depth of the historical (post-settlement) alluvium (PSA) deposit covering the Swan Lake HREP exceeds the maximum depth of construction impact within most of the project area, but that the maximum depth of construction impact extends below the PSA deposit within four of the borrow areas, the construction area of each of the pump stations, and the construction corridor of a pump station access road. One or more early to late Holocene soil surfaces were identified in the construction impact zone in each of these areas, and some of these native soils were characterized as having potential for containing cultural resources. Consequently, the archaeological survey conducted following completion of the geomorphological investigation focused on the areas containing these soils.

Two archaeological sites, sites 11-C-152 and 11-C-212, were investigated during the present investigation. Previously recorded site 11-C-152, the Persimmon site, was found to extend into the proposed construction area of Pump Station #3. Because this portion of the site appears to contain an intact midden remnant associated with Early Woodland, and possibly, Late Woodland occupations, and may contain features associated with these components as well, it is evaluated as eligible for inclusion on the NRHP. If the site can not be avoided, it is recommended that the adverse effects of proposed construction be mitigated through conducting a Phase III investigation of the portion of the site located inside the project area.

Site 11-C-212, a buried site containing both prehistoric and historic components, was recorded in Borrow Area D during intensive subsurface testing. The historic component at the site is interpreted as a late nineteenth-century rural habitation/farmstead and associated disposal/discard area. Due to its relatively recent age, and questionable integrity, the historic component at site 11-C-212 is evaluated as not potentially eligible for listing to the NRHP. No further archaeological work is recommended at the historic component at site 11-C-212.

The prehistoric component at site 11-C-212 is interpreted as a field camp dating to the Early Woodland period. This occupation was identified in the northeastern corner of Borrow Area D beneath 1.15 m of PSA. The prehistoric component at site 11-C-212 is evaluated as potentially eligible for listing to the NRHP. If the prehistoric component at site 11-C-212 can not be avoided, it is recommended that Phase II investigations be undertaken at the site to further document its

NRHP eligibility. SHPO concurred with these recommendations in a letter of February 9, 1995.

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CHAPTER I. INTRODUCTION

This report describes the results of a Phase I archaeological and geomorphological investigation within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP) project area. The Swan Lake complex is located in Navigation Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right [west] bank), Calhoun County, Illinois (Figure 1). This research was carried out by American Resources Group, Ltd., Carbondale, Illinois, for the St. Louis District, U.S. Army Corps of Engineers, under the terms of a subcontract (No. DACW43-93-D-0514) with Harland Bartholomew and Associates, Chesterfield, Missouri.

Project Description

The Swan Lake HREP is part of the Environmental Management Program established by PL-99-662 to enhance and rehabilitate the Upper Mississippi River system. The project area is located on Corps of Engineers fee land managed by the Illinois Department of Conservation (IDOC) and the U.S. Fish and Wildlife Service (FWS). The southern and central portions of the project area are contained within the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge (FWS)(Figures 2 and 3) and the northern portion is contained within the Fuller Lake State Fish and Waterfowl Management Area (IDOC)(Figure 2). The purpose of the Swan Lake HREP is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in the three lake units. Accordingly, the St. Louis District is proposing to construct a riverside (exterior) levee, one interior closure, five borrow areas, and one borrow trench in Swan Lake, one lower closure between Swan Lake and the Illinois River, one drainage swale, one relocated road, three pump stations with channels and control structures, one pump station access road, two boat ramps with parking lots and access roads, and two island groups. The project area consists of the construction corridors of the proposed exterior levee, the relocated road, the drainage swale, and the pump station access road, as well as the proposed locations of the five borrow areas, the three pump stations and associated channels, the two boat ramps and associated parking lots and access roads, and the two (land) ends of the interior closure (Figures 2, and 3). The total area contained in the project area is approximately 95 acres.

The primary objectives of the geomorphological investigation were to determine the depth of the PSA (post-settlement alluvium) deposit across the project area, and to investigate the potential for buried cultural resources at locations where construction may extend below these recently-deposited sediments. These objectives were achieved through a combination of soil

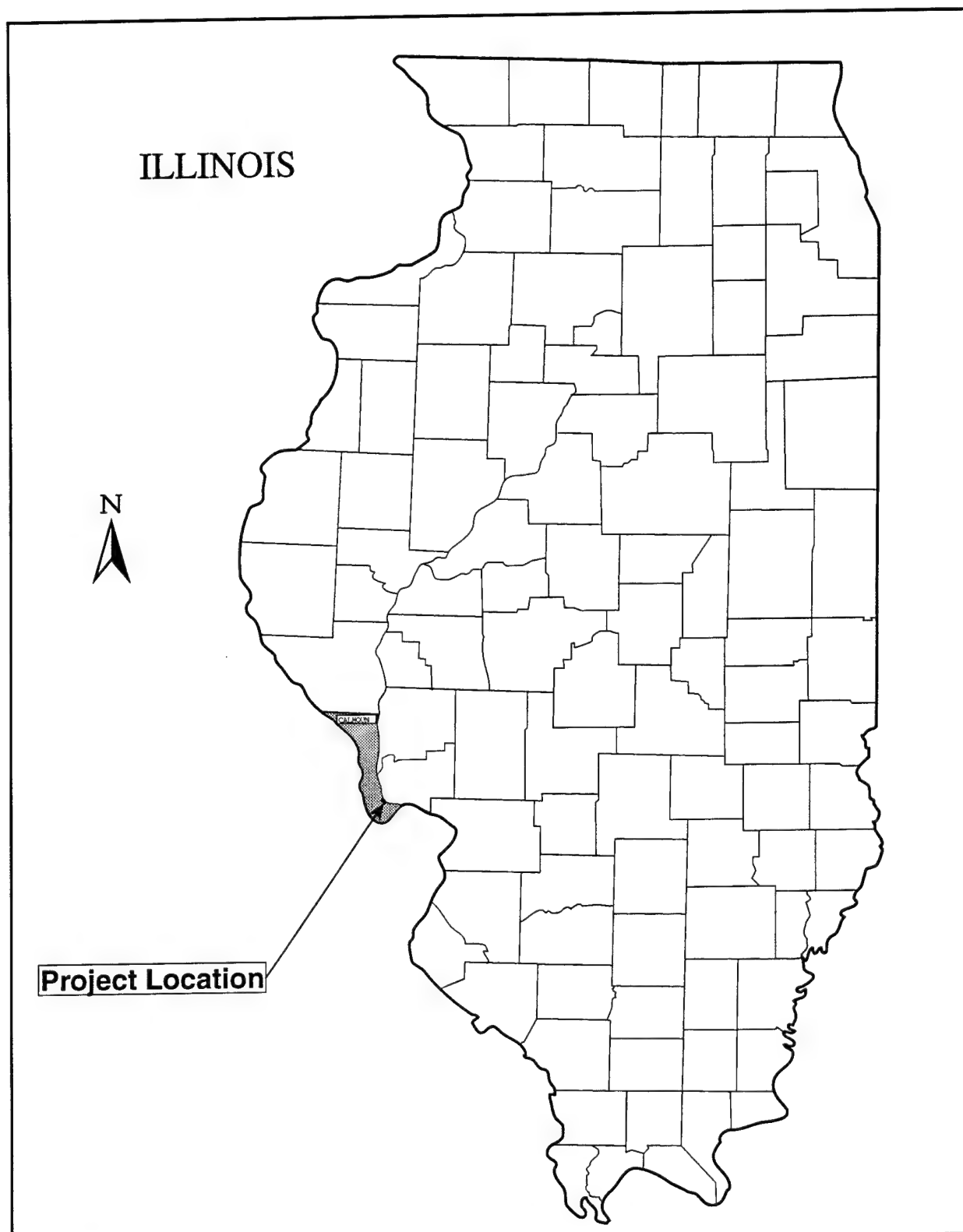
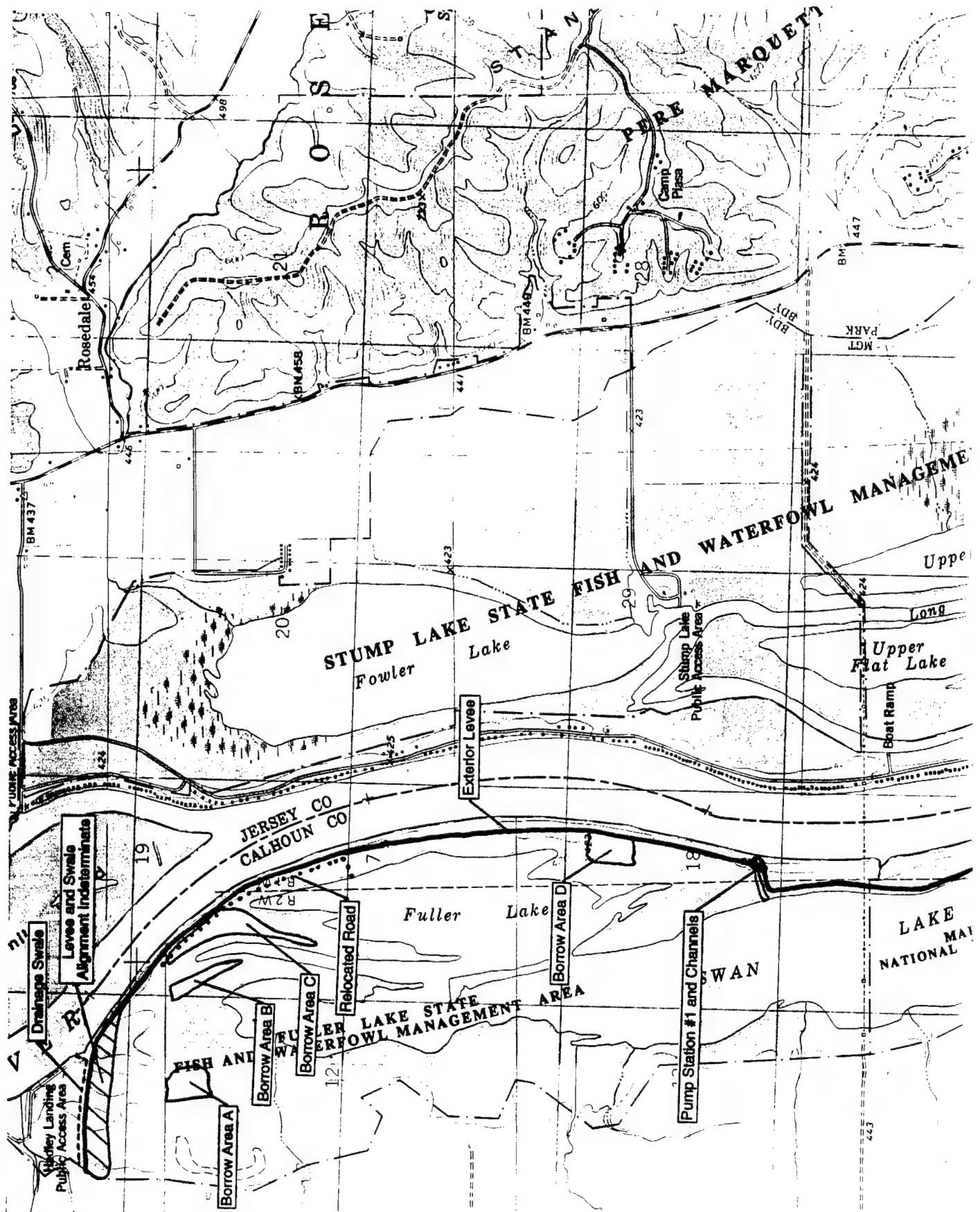
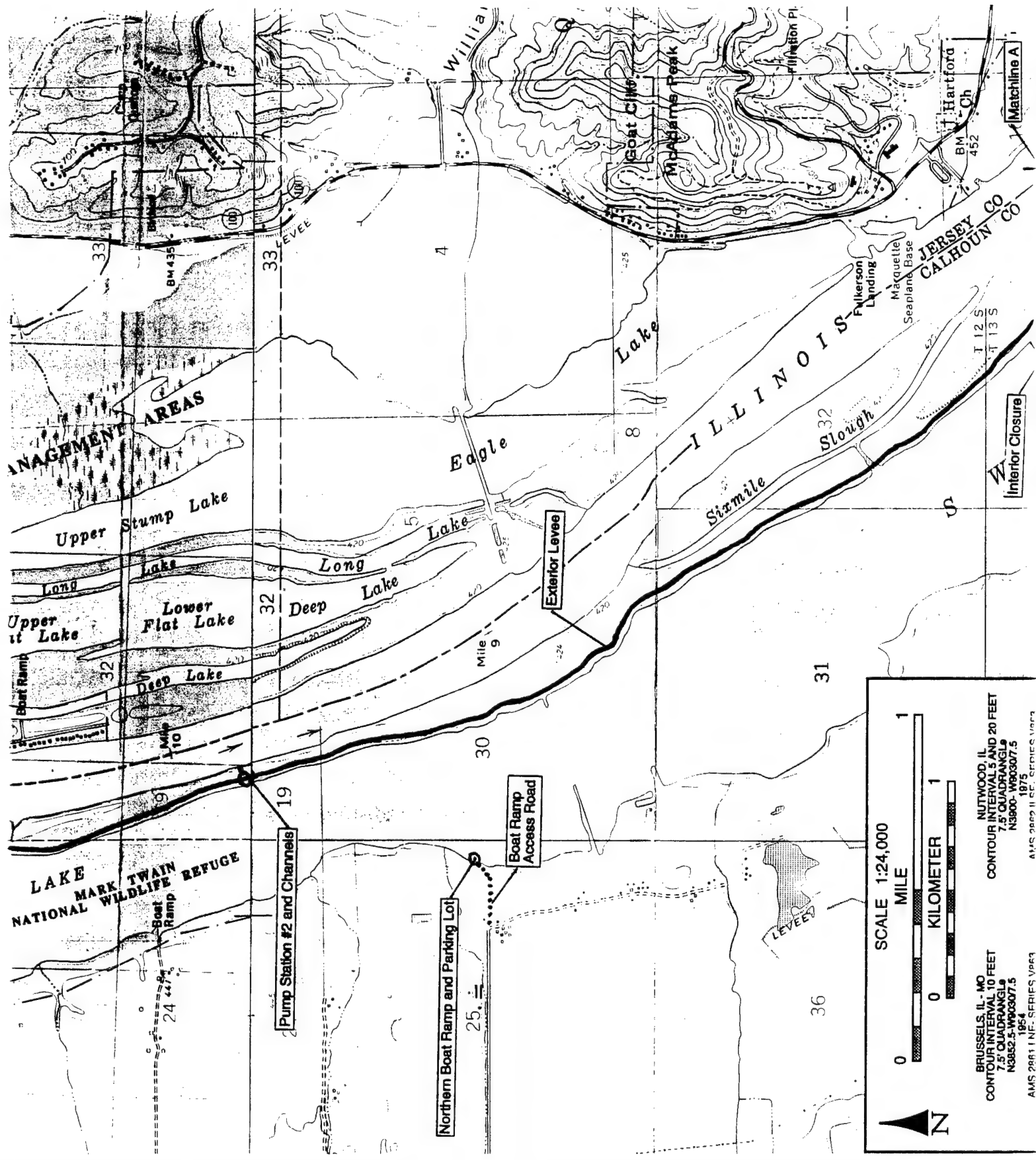


Figure 1. General location of the Swan Lake HREP project area.





2

SCALE 1:24,000

0 1 MILE

0 1 KILOMETER

N

BRUSSELS, IL - MO
CONTOUR INTERVAL 10 FEET
N3852.5-W0307.5
1954
AMS 2881 INF. SERIES V0693

NUTWOOD, IL
CONTOUR INTERVAL 5 AND 20 FEET
7.5' QUADRANGLE
N3800-W0307.5
1975
AMS 2809 II RE. SERIES V0693

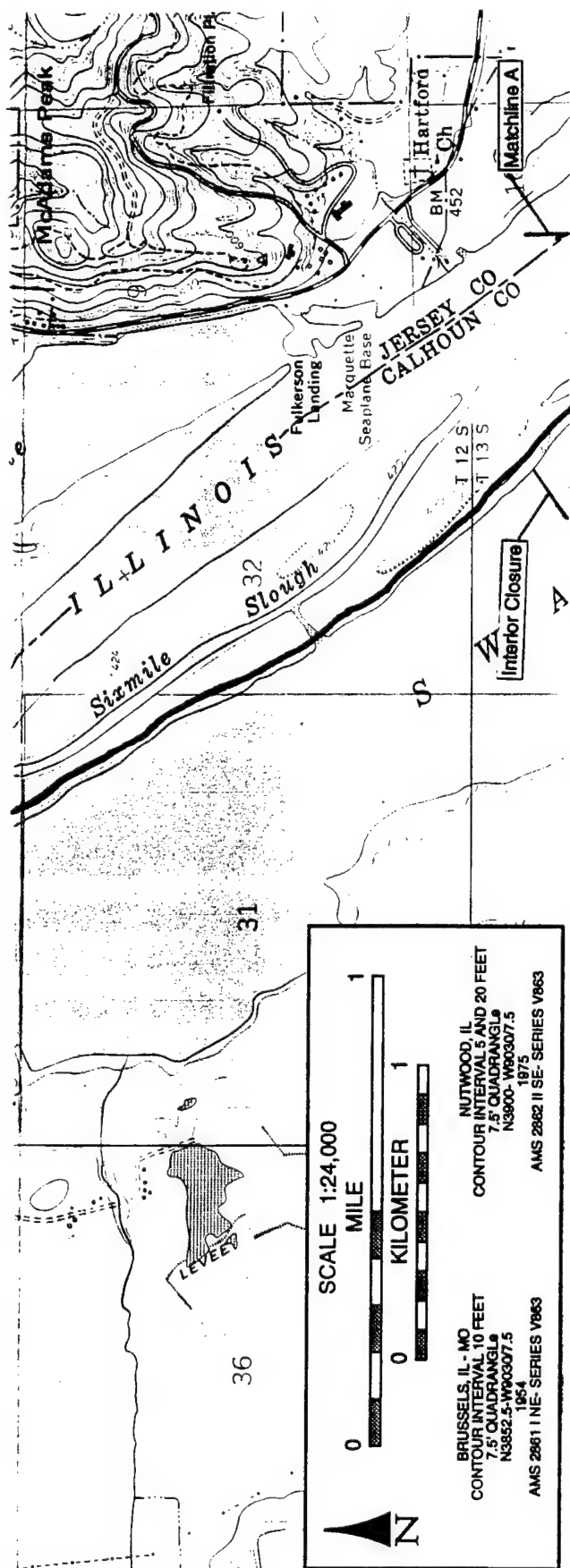


Figure 2. Topographic location of the northern and central portion of the Swan Lake HREP project area.

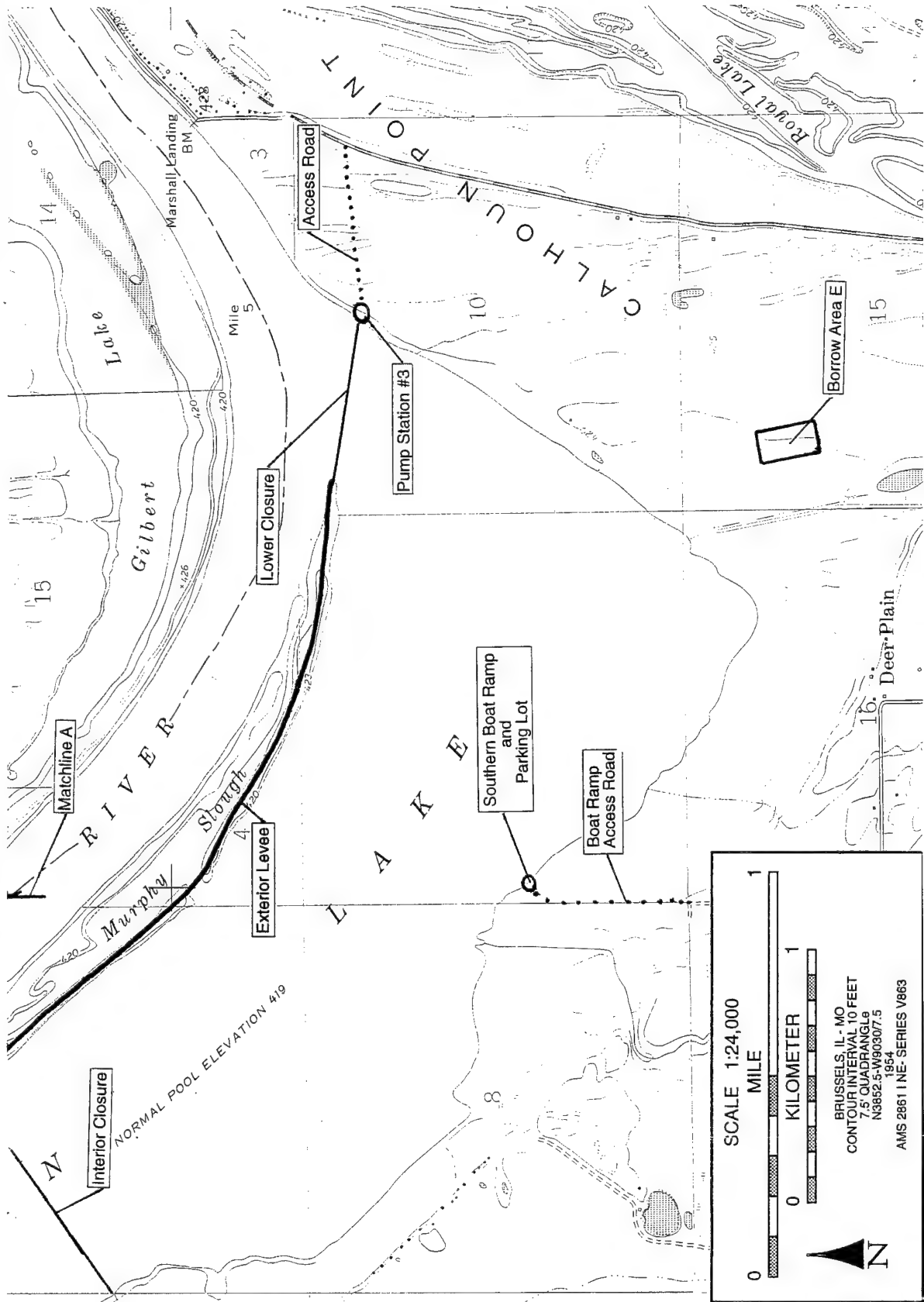


Figure 3. Topographic location of the southern portion of the Swan Lake HREP project area.

coring and backhoe trenching. The primary objectives of the archaeological survey were to identify historic properties located within the project area, and provide a preliminary assessment of their eligibility for listing to the National Register of Historic Places (NRHP). The objectives of the archaeological investigation were achieved through a records check and literature review conducted to identify previously-recorded cultural resources within the project area, and a field survey of the project area conducted to identify unrecorded cultural resources. The data derived from the subsequent analysis of the investigated cultural resources and their respective assemblages were used to evaluate those resources against the NRHP criteria of significance (36CFR60.6, Federal Register 1976).

All work conformed to professional standards and guidelines set forth in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register 1983). The methods employed in the study were implemented in accordance with the specifications presented in Sections 4 and 7 of the project scope of work (Appendix A). Accomplishment of this work provides documentation evidencing compliance with Section 106 of the National Historic Preservation Act of 1966.

Personnel

Field investigations were conducted October 10-14 and October 24-27, 1994. Michael J. McNerney is principal investigator, Steve Titus directed the archaeological survey with the assistance of Wes Neal and Jim Snyder, and Jeff Anderson carried out the geomorphological study. Wes Neal conducted the prehistoric artifact analysis, Jim Snyder analyzed the historic artifacts, and Jarvis Schultz and Jim Balsitis prepared the report graphics. Project archaeologist for the Corps was Suzanne Harris.

Steve Titus wrote Chapters I and VII of this report, Gordon Howe wrote Chapters II and III, and Jeff Anderson wrote Chapter V. Chapters IV and VI were written by Steve Titus and Wes Neal.

Organization of the Report

The natural environment of the project area is briefly summarized in Chapter II. Previous archaeological research conducted in the project area and an overview of the culture history of Calhoun County are presented in Chapter III. The research design of the project, including the field and laboratory methods employed in the study, is presented in detail in Chapter IV. The results of the geomorphological investigation are presented in Chapter V. The results of the archaeological field investigation, including physical descriptions of each site, sketch maps, and artifact inventories, are presented in Chapter VI. Evaluations regarding the National Register eligibility of the sites located by the survey, and recommendations concerning the need for additional work, are presented in Chapter VII. The project scope of work is presented in Appendix A.

CHAPTER II. ENVIRONMENTAL SETTING

Introduction

The project area is contained within the Swan Lake Habitat Rehabilitation Project (HREP) area within the lower Illinois River Valley in west-central Illinois. The project area extends from mile 5.0 to mile 13.0 along the west shore of the Illinois River in Calhoun County, Illinois. The Swan lake HREP includes the Fuller Lake State Fish and Waterfowl Management Area, which is managed by the Illinois Department of Conservation, and a portion of the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service.

Regional Setting

The Swan Lake HREP is located within the southern portion of the Illinois River Section of the Upper Mississippi River and Illinois River Bottomlands Natural Division (Schwegman 1973:2). The headwaters of the Illinois River are formed by the confluence of the Kankakee and Des Plains rivers in northeastern Illinois. From that point the river flows in a southwesterly direction across central and west-central Illinois, ultimately discharging into the Mississippi River below the town of West Grafton, Illinois. The channel of the Illinois River is relatively straight, with meanders limited to the margins of several large channel islands. Channel width averages 350 m. Maximum depth prior to 1902 was approximately 6 m (20 ft) at bankfull stage (Butzer 1977:13).

The Swan Lake HREP is located in the unglaciated Middle Mississippi Border Division of Illinois. Referred to as the Lincoln Hills Section of the Ozark Plateaus Province (Leighton et al. 1948), this physiographic province represents the northernmost extension of the Ozarks. The rather flat-lying strata of the Lincoln Hills Section produce a heavily dissected landscape characterized by deeply incised drainages and narrow upland ridges that contrast with the high hills produced by the folded and faulted strata in the Salem Plateau in Missouri (Willman et al. 1975).

Geology

The Illinois River Valley represents a deep entrenchment of the Illinois River into the flanking uplands contained within the Western Forest-Prairie and Grand Prairie Divisions (Schwegman 1973). The Western Forest-Prairie Division is underlain by Pennsylvanian and

Mississippian limestone, sandstone, and shale. Numerous rock outcrops occur along the major streams. Limestone bluffs border the Illinois River Valley from its confluence with the Mississippi River to a point approximately 60 miles upstream in Schuyler County (Krey and Lamar 1925). A karst landscape characterized by numerous sinkholes and caves has resulted from the solution of the Mississippian carbonates underlying the uplands of Calhoun County. Several caves have been found in Calhoun County, including Panther Creek, Crater Creek, De Gerlia, Cave Spring and Hardin (Bretz 1961). Sandstone of the St. Peter Sandstone Formation, most commonly measuring from 100 to 200 feet thick, is exposed in sections of the upper Illinois River Valley. Exposed outcroppings of this material occur in the form of sandstone bluffs, canyons, and buttes. The most notable example of the latter type of formation is Starved Rock, a 125-ft-high butte overlooking the Illinois River Valley near La Salle, Illinois (Schubert 1986:65-66). Starved Rock, which overlooks the location of the historic Indian settlement known as the Grand Village of the Kaskaskia, is reported to have been the site of a fort constructed by the French explorer La Salle in the seventeenth century.

The geology of the Swan Lake HREP vicinity is dominated by the breaching of the Lincoln Anticline by the Illinois River. Entrenchment of the river has exposed Devonian, Silurian, and Ordovician strata that form steep bluffs along the lower stretches of the river valley (Willman et al. 1975). These outcrops provided the prehistoric inhabitants of the region ready access to important lithic materials. Of primary importance to prehistoric groups in the Lower Illinois River Valley would have been chert sources. Naturally occurring chert in the region is found in bedrock exposures, as weathered/residual chert, and as chert redeposited by stream action (Meyers 1970:26). Important chert-bearing limestones located within a three-mile radius of the project area include the Chouteau, Burlington, Keokuk and St. Louis (Meyers 1970:31, Figure 3).

Soils

Floodplain soils within the project area are part of the Plano-Proctor-Worthen soil association (Fehrenbacher et al. 1984). These soils are found primarily in the northern and central portions of the state, but occur to a limited extent in southern Illinois along the Mississippi and Ohio Rivers. This association comprises 5.2% of the land area of the state (Fehrenbacher et al. 1984). These soils are dark-colored, occur on level to nearly level to sloping glacial outwash plains and alluvial terraces of Wisconsinan age. Some soils within this association, however, are found on sandy tills or drift plains. These prairie soils formed in loess deposits of various thicknesses or in silty material over stratified silty, loamy or sandy sediments. Due to the silt content, these soils tend to have moderate permeability, but range in drainage from well to poor (Fehrenbacher et al. 1984).

East and just downstream of the project area, on Calhoun Point, the soils are classified as belonging to the Lawson-Sawmill-Darwin association (Fehrenbacher et al. 1984). These soils occur in all of the major floodplains of the state, as well as in the floodplains of many minor drainages. This association, one of the most widespread in the state, comprises 6.5% of the total land area of the state. These dark to moderately-dark colored soils are formed in stratified clayey

to sandy alluvium under native prairie and deciduous forests, and are found on nearly level to gently sloping surfaces. In general, the permeability of these soils tends to be moderate, with variable, but mostly poor, drainage (Fehrenbacher et al. 1984).

The Illinois River Valley contains extensive broad floodplains and gravel terraces formed by glacial floodwaters. Backwater lakes and spring bogs are common features along the bluff base (Schwegman 1973:17). The general topography is one of level to rolling plains of sands deposited by glacial meltwaters. Extensive low sandy terraces occur in some areas of the valley (Butzer 1977:17). The floor of the valley is capped by stratified alluvial sediments that are classified as Cahokia Alluvium (Lineback 1979). These sediments occur in the floodplains and channels of modern rivers and streams. The sediments are composed of poorly sorted sand, silt, and clay, and may contain local deposits of sandy gravel (Lineback 1979).

Flora and Fauna

Modern vegetation within the Illinois River Valley consists of scrub forests, with black and blackjack oaks as dominant species, and dry, wet, and mesic prairies. Common prairie plant species include big bluestem (*Andropogon gerardii*), with Indian grass (*Sorghastrum nutans*), wild rye (*Elymus canadensis*), switch grass (*Panicum virgatum*), and slough grass (*Spartina pectinata*) as secondary grass species (Voigt and Mohlenbrock 1964:150).

The bottomland would have contained a wide range of mammalian, avian, and aquatic fauna prior to Euro-American settlement. Governor Reynolds (1882:232-233) provided the following description of the Illinois River valley as it appeared at the inception of American settlement:

The region of the country adjacent to the Illinois River...produced the strongest vegetation in olden times of any other section of Illinois, and the rivers and swamps adjacent to it afforded the natives more support than any other part of the West. The fowls, in the spring and fall in their migrations, stopped here and the Indians killed many of them. Also a great number of musk-rats were caught in the lakes near the river, and it was conceded by all that no river in America produced as many fresh-water fish as the Illinois did. This great supply of provisions for the Indians enabled more of them to subsist in this section of the country than any other in the West.

Semiaquatic fauna that prefer a bottomland environment that would have been found in the Illinois River floodplain prior to American settlement include the mink (*Mustela vison*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and muskrat (*Onychomys leucogaster*). Other animals that would have been available in both the bottomland and the uplands to the west include the opossum (*Didelphis marsupialis*), gray fox (*Urocyon cinereoargenteus*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*) and southern flying squirrel (*Glaucomys volans*), striped skunk (*Mephitis mephitis*), groundhog (*Marmota monax*), and white-tailed deer

(*Odocoileus virginianus*) (Shelford 1963). Animal species once present in the region, but now extirpated, include the American elk (*Cervus canadensis*), black bear (*Ursus americanus*), and passenger pigeon (*Ectopoistes migratorius*).

Amphibians and reptiles that prefer a bottomland environment include black racer snakes, the eastern box turtle (*Terrapene carolina*), and the midland painted turtle (*Chrysemys pictamarginata*). Common avian species would have included wild turkey (*Meleagris gallopavo*) and bobwhite (*Colinus virginianus*). Various species of geese, ducks, herons and other waterfowl that frequent the Mississippi Flyway would have been seasonally available.

Butzer (1977) has presented convincing evidence that landforms and vegetation within the Illinois River Valley form a dynamic ecosystem that has experienced dramatic change through time. Ancient landforms dating back thousands of years that once represented the original ground surface now lie deeply buried beneath alluvial and colluvial sediments. More significantly, Butzer (1977) notes that modern vegetation conditions within the Illinois River Valley date back only to the beginning of the Mississippian period (ca. A.D. 1000). Consequently, attempts to examine earlier prehistoric settlement patterns within the drainage on the basis of modern vegetation patterns or Government Land Office (GLO) data may be in error.

Worthen's (1868:105) account indicates that noticeable changes in the floodplain topography had occurred by the late nineteenth century as a result of siltation caused by the flooding of the Illinois River:

The soil on this bottom land is a deep sandy loam, formed mainly by the wash from the high lands of the adjacent bluffs, and the sediment deposited by the river, which submerges the lower portion of it during its annual overflows....The surface of these lands is gradually being elevated from year to year by the causes already alluded to; the swampy portions are filling up, and the arable land is thus constantly increasing.

Worthen's (1868:105-106) account also indicates that dramatic changes within the floodplain ecosystem occurred during the nineteenth century as the fertile river bottomland was put into cultivation and the mesic prairies destroyed:

When the country was first settled these bottoms produced annual crops of most luxuriant grasses, growing oftentimes, in wet portions, to a height [sic] of six or eight feet, and the annual decay of so great an amount of vegetable matter upon the surface produced a malorious atmosphere that was quite deleterious to the health of the early settlers upon these lands. But when the soil was once broken and the ground brought under cultivation over a considerable portion of the surface, and the luxuriant growth of vegetation on other portions was consumed by the herds of cattle that were allowed to graze upon it, the general health of the settlers improved....

Worthen went on to note that:

....large crops of corn, wheat, oats, barley, and potatoes...are often grown year after year on the same ground, without manure, and with no perceptible diminution in the value of the crops (Worthen 1868:105).

Swan and Fuller Lakes were formed by the construction of Lock and Dam 26. A review of the 1827 GLO survey plat for the Swan Lake area indicates that the flood basin inundated by these lakes was covered by wet prairie and forest, while a large portion of the Deer Plain Terrace bounding the southern and eastern margin of the present Swan Lake was covered by level prairie. Surrounding forests consisted of an oak-hickory community with maple, elm, ash, willow, and sassafras also being present.

Water levels in the open lake units within the Swan Lake HREP were controlled by Lock and Dam 26 from 1933 to 1990. Since 1990, lake levels have been controlled by the Mel Price Locks and Dam, located downstream from the project area. The results of earlier Bureau of Land Management (BLM) geomorphological studies, as well as those of the present study, indicate that sediments have been accumulating in the Swan Lake HREP at a fairly rapid rate for the past 150 years. This sedimentation rate has increased as a result of lock and dam construction. At least five feet of recent historic sediments have been deposited in the lake bed since 1903, and the Corps of Engineers estimates the sedimentation rate in the project area to be approximately .5 inch of sediment per year. A geomorphological study conducted by the BLM for the Corps in 1994 found that between 36 and 70 inches of sediment was deposited over boundary monuments in the project area since 1935-1940.

Local Environmental Setting

The project area is located adjacent to the right bank of the Illinois River and the eastern and northern margins of Swan and Fuller Lakes, at an elevation of 420' AMSL. Present vegetation within the survey area consists of both agricultural fields and forested areas.

The annual siltation of the floodplain described by Worthen (1868) due to the flooding of the Illinois River and consequent deposition of fluvial-borne sediments on the ground surface is turning the lakes within the project area into shallow sloughs. Wetland forest communities consist of the silver maple-cottonwood, silver maple-cottonwood-pin oak, and willow communities. Animal species within this semi-aquatic habitat are similar to those described above for the Illinois River valley as a whole. These included wood ducks, raccoon, white-tailed deer, cottontail rabbit, foxes, tree squirrels, songbirds, turkey, salamanders, frogs, snakes, and turtles (U.S. Army Corps of Engineers 1992:15).

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CHAPTER III. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Prehistoric Overview

Archaeologists have developed a broad cultural/historical classificatory scheme with which to organize and describe the prehistory of the Midwestern and Eastern United States. The cultural periods are: Paleo-Indian (15,000-8,000 B.C.); Early Archaic (8,000-6,000 B.C.); Middle Archaic (6,000-3,000 B.C.); Late Archaic (3,000-1,000 B.C.); Early Woodland (1,000-400 B.C.); Middle Woodland (400 B.C.-A.D. 400); Late Woodland (A.D. 400-A.D.1000); and the Mississippian period (A.D.1000-A.D. 1600). These periods are established on the basis of cultural traits identified through archaeological research and are not to be confused with the historic tribal groups which were encountered by the first Europeans to arrive in the New World.

This long prehistoric period is characterized by an increase in cultural complexity, beginning with small hunting and gathering societies which evolved into more complex societies. Subsistence activities began with the collecting of wild plant and animal foods and culminated with the domestication of the three major New World crops--corn, beans and squash--during the final Mississippian period. Population growth and a trend toward increased sedentism are evident in the archaeological record, reaching their highest levels during the Mississippian period.

The Paleo-Indian period is best known from the western United States where numerous archaeological sites have produced cultural material in association with late Pleistocene megafauna. These are the well-known Clovis and Folsom cultures associated with extinct mammoth and bison, respectively. Evidence from Kimmswick, Missouri (Graham et al. 1981) presents a picture of a varied subsistence base for Clovis culture utilizing mammals ranging from squirrels to mastodons. Major Paleoindian sites are also known from the eastern United States. However, in the Illinois River Valley, evidence of Paleo-Indian occupations is represented primarily by surface finds of artifacts diagnostic of the period.

The Early Archaic period in the Illinois River Valley is represented by surface finds of tools diagnostic of this cultural period, as well as by buried deposits. Dalton, Thebes, Dove-Tail, Hardin Barbed, and Agate Basin projectile points are commonly associated with the Early Archaic period. Luchterhand (1970:42) suggests that the surface distribution of Early Archaic projectile points within the Illinois River Valley indicates intensive exploitation of deer during the winter months when they aggregate in sheltered secondary valleys. More recent evidence, however, indicates that Early Archaic occupations may be deeply buried in some areas of the floodplain, while they are exposed on the surface in others, making interpretations of Early Archaic settlement

patterns from the surface distribution of artifacts a dubious endeavor (Wiant et al. 1983:147). The Koster site, for example, contains a series of stratified deposits with associated living floors, features, artifacts, and botanical and faunal remains that extend back into the Early Archaic period (Cook 1976; Houart 1971; Phillips and Brown 1983). Evidence has been found of intensive utilization of the Illinois River floodplain during the Early Archaic period (Connor 1984; Stafford et al. 1983), primarily in the form of what appears to be small encampments designed to exploit floodplain food resources (Stafford 1989:119). Subsistence-settlement strategies appear to have been based on the scheduled exploitation of seasonally available resources through high residential mobility (Brown and Vierra 1983:190).

By 6,000 B.C., the environment was essentially modern, and the Middle Archaic can be described as continuing a trend toward broad spectrum resource utilization and toward more efficient adaptation to forested environments (Caldwell 1958; Fowler 1959). In Illinois this trend is shown by the diversification of tool kits and the appearance of more ground stone artifacts, including full-grooved axes (Griffin 1968). Other new artifact types include stone pendants, bannerstones, and various bone tools such as awls, antler projectile points, atlatls, bone fish hooks, tortoise shell cups, and necklaces of mammal teeth (Griffin 1968:133).

Within the Illinois River Valley, Middle Archaic occupations have been identified at the Koster (Houart 1971) and Napoleon Hollow (Wiant et al. 1983) sites, among others. Intensive harvesting of hickory nuts occurs for the first time. More intensive plant utilization is indicated by the recovery of small numbers of squash rinds, sumpweed seeds, and other plant remains at the Koster site. In contrast to the residential mobility of the Early Archaic period, Middle Archaic settlement patterns within the Illinois River Valley are marked by a trend toward increasing sedentism. Occupation lengthened at strategic locations in response to increasing availability of floodplain resources. Key to this development was the growth of food-rich slack water environments in the valley that resulted in a concentration on this resource zone to the exclusion of other alternatives (Brown and Vierra 1983:189-190).

The Late Archaic period (3000-1000 B.C.) in the Illinois River Valley witnessed a continuation and elaboration of the settlement and subsistence trends of the Middle Archaic period. Considerable growth in population, distinct regional adaptations, and interregional exchange systems are hallmarks of this era. Archaeological data point to a marked increase in the exploitation of plant resources.

During the Early Woodland period, the Illinois River Valley was hydrologically similar to that encountered by early nineteenth-century Euro-American settlers (Farnsworth and Asch 1986:327). Broad similarities exist among Terminal Archaic/Early Woodland (1 200-600 B.C.) manifestations in west central Illinois, the Illinois River Valley, and the American Bottom. Designated the Prairie Lake culture by Farnsworth and Asch (1986:340), defining characteristics include Kampsville Barbed projectile points and Snyders Grooved plummets. Within the Illinois River Valley, Kampsville Phase Prairie Lake culture sites have been documented in bluff-base settings. Bluff top burial mounds also occur. Faunal remains indicate exploitation of a wide

variety of aquatic and terrestrial species, while floral remains indicate plant harvesting with nut collecting as an important constituent.

Early Woodland temporal and spatial divisions recognized within the Lower Illinois River Valley include the Marion phase of the Marion Culture, the Cypress phase of the Black Sand Culture, and the Mound House phase of the Initial Havana Culture (Farnsworth and Asch 1986:331). Marion Phase sites have been identified on both the Mississippi and Illinois River floodplains. Subsistence data indicate the use of upland and bottomland plant species as well as domesticated squash, barley, and goosefoot. Although Cypress phase sites may lie buried beneath alluvial flats similar to those of the Swan Lake area, occupation of such areas was probably restricted to short-term exploitative camps (Farnsworth and Asch 1986:406).

The Middle Woodland period is the time when the Hopewellian Interaction Sphere (Struever 1964) connected distant Middle Woodland groups by a highly developed socioreligious organization. Large regional centers which exhibit groups of conical shaped burial mounds were the focal points for Hopewellian activities during this time period. Middle Woodland sites are numerous in the lower Illinois River Valley and occur in a variety of physical settings including the natural levees of the Illinois River, undissected uplands, alluvial and colluvial fans, adjacent to back-water lakes, in tributary valleys, along the bluff base, and in the floodplain. Middle Woodland floodplain settlements include extractive camps located adjacent to back-water lakes and possible mortuary-related sites (Farnsworth 1976; McGimsey and Wiant 1986; Stafford and Sant 1985). Subsistence data indicate intensive utilization of back water fauna, collection of hickory and hazel nuts, and cultivation of starchy seed annuals including maygrass, little barley, and goosefoot (Stafford and Sant 1985:453).

The end of the Middle Woodland (Hopewell) period at approximately A.D. 400 was marked by a reduction in interregional trade, a decrease in the complexity of ceremonial/mortuary practices, and a reduction in the elaborateness of ceramic decoration. As noted by Nassaney and Cobb (1991:2), the Late Woodland period remains "little studied and enigmatic" despite the large amount of archaeological research conducted over the past 20 years. The period traditionally has been viewed as one of social decline, the result being that "the archaeological remnants of (Late Woodland) culture are frequently studied for what they can tell us about the Hopewellian dissolution or the emergence of the Mississippian culture" (Nassaney and Cobb 1991:1). In contrast to this view, Nassaney and Cobb (1991:1, 6) have characterized the Late Woodland period as a "time of markedly uneven sociocultural development . . . [in which there was] considerable variation in social relations, accompanied by similar diversity in ideology, subsistence, technology, and other realms . . . [this] diversity . . . argues strongly for processes of social stability and transformation in the Southeast that are linked to ecological, political, and economic variation at both local and regional levels." In the same vein, Green (1987:2) argues that Late Woodland research has the potential to provide information on cultural change and continuity in the form of the adjustments that human societies made during this time period to a complex and changing social and biophysical environment.

The White Hall phase (A.D. 450-650) is the earliest Late Woodland phase in the lower Illinois River valley (Styles 1981). Continuity with the preceding Middle Woodland period is reflected in a subsistence base that involved the utilization of terrestrial and riverine species, nuts, and cultivated plants. Settlements tended to be small and located in a variety of ecological zones (Connor 1985:2).

The Early Bluff (A.D. 600-800) phase is characterized by an apparent population increase as reflected in an increase in the number, size, and complexity of sites. Although the subsistence base is similar to that of the preceding Late Woodland phase, the appearance of small projectile points during this time indicates the adoption of the bow and arrow. These trends continue into the Late Bluff (A.D. 800-1000) phase with the addition of maize, which supplements, but does not replace, other cultigens. Within the American Bottom to the south, the subsistence patterns and ceramic styles associated with the Late Bluff phase gradually change into those of the Mississippian pattern by the end of the Late Woodland era (Connor 1985:3).

Mississippian culture (A.D. 1000-1600) represented the culmination of social, economic, political, and technological trends begun in the Late Woodland period. This period was characterized by an increased dependency upon agriculture as a subsistence base and increased social stratification and complexity. Settlement patterns were characterized by large regional population centers surrounded by a radiating network of agricultural and special purpose sites. Large ceremonial centers, such as the Cahokia site in the American Bottom to the south, contained flat-topped temple mounds, plazas, and fortifications. These sites are thought to have functioned as central places with respect to economic as well as ceremonial activities.

Diagnostic Mississippian artifacts include shell-tempered pottery, finely-made Madison and Cahokia arrow points, and farming implements, including bifacial chipped stone hoes commonly made of chert from the Mill Creek quarries in southern Union county (Cobb 1992). The chert hoes often became heavily polished through use and small chips with polished surfaces (hoe chips) that were struck from the hoes as a result of reworking or sharpening them are commonly found at Mississippian habitation sites. The presence of hoe chips is often interpreted as evidence of agricultural activity. Small artifact scatters containing shell-tempered pottery and hoe chips are frequently characterized as "farmsteads" or "homesteads" (Milner et al. 1984; Muller 1978; Wagner 1986). The carbonized remains of cultivated plants, including corn, squash, sunflowers, various starchy and oily seeds, and, more rarely, beans, are found at Mississippian habitation sites (Milner et al. 1984).

Investigations of the Mississippian period in the lower Illinois valley have primarily been restricted to the excavation of mortuary features at the Schild cemetery (Goldstein 1980; Perino 1971) and other sites (Perino 1971). Mississippian utilization of the region appears to be much less intensive than that of the central Illinois River valley to the north and the American Bottom to the south. Noticeably absent are larger town sites with platform mounds. Instead, a series of small settlements analogous to the "fourth line" communities of the Mississippian settlement system of the American Bottom region are distributed along the main channel of the Illinois River Valley

and at the mouths of feeder streams (Connor 1986:218-219). Goldstein (1980) and Connor (1986) have suggested that the lower Illinois River Valley functioned as a resource procurement area during the Mississippian period, with the Mississippian inhabitants of the area possibly supplying dried meat, fish, skins, chert, and other materials to larger Mississippian centers in the central Illinois River Valley and American Bottom. Based on both survey information and excavation data from the Hill Creek site, a late (A.D. 1150-1350) homestead, Conner (1986) has proposed that during early Mississippian times the lower Illinois valley had ties to the American Bottom to the south while during later times these ties shifted to the central Illinois River Valley to the north.

Historic Background

When the first French explorers ventured down the Illinois and Mississippi Rivers, the territory around Calhoun County was controlled by the Illinois Confederacy. The Illinois Confederacy was composed of five tribes, the Peorias, Cahokias, Tamaroas, Kaskaskias, and Mitchagamies. Initially, the territory controlled by the Illinois Confederation was immense, encompassing most of the territory within the State of Illinois. By the time the French arrived in the region, the power of the confederation and the territory it controlled had been severely reduced. The Illinois were attacked from the west by the Sioux and Dakota tribes, the Sac and Fox and Kickapoos from the north, and the Iroquois from the east (Carpenter 1967:5). Of all the tribes attacking up and down the frontier, the Iroquois afflicted the most severe punishment on the Illinois. In the seventeenth century, the Iroquois were pushing west into the Illinois territory to attack Illinois villages up and down the river. In 1680, a war party of Iroquois made their way down the Illinois River, destroying Illinois villages along the way. While the actual attacks were not witnessed by the French, La Salle, leading a party down the river a few days behind the Iroquois, provided a vivid description of the destruction that was taking place. La Salle passed the grand village of the Illinois, Fort Crevecoeur and other deserted villages and camps that had been pillaged and destroyed by the Iroquois. In November of 1680, at a point just above the mouth of the Illinois River, the Iroquois massacred a group of the Tamaroa camped on the right (west) bank of the river, near the southern edge of a prairie, in southern Calhoun County. A reconstruction of La Salle's description of the camp, examined a few days after the attack, can be found in Parkman (1931). According to Parkman, after he left Fort Crevecoeur:

La Salle and his companions hastened on, and during the following day passed four opposing camps of the savage armies. The silence of death now reigned along the deserted river, whose lonely borders, wrapped deep in forests, seemed lifeless as the grave. As they drew near the mouth of the stream they saw a meadow on their right, and on its farthest verge several human figures, erect, yet motionless. They landed, and cautiously examined the place. The long grass was trampled down, and all around were strewn the relics of the hideous orgies which formed the ordinary sequel of an Iroquois victory. The figures that had seen were the half-consumed bodies of women; bound to the stakes where they had been tortured. Other sights there were, too revolting for record. All the remains were those of women and children.

The men, it seemed had fled, and left them to their fate . . . Once more descending the river, they soon reached its mouth. [Parkman 1931:211-212].

According to Temple (1966:24) and Carpenter (1967:6), the Iroquois killed 1,200 Tamaroa in this attack. The location of the Tamaroa Indian massacre site has not been determined, but several lines of evidence suggest the massacre occurred about one mile upstream from the Deer Plain Ferry (Brussels Ferry), near the present location of the community of Marshall Landing (Carpenter 1967:24; Temple 1966:24).

According to local farmers, a large number of human skeletal remains and weapons have been plowed up in the fields adjoining the residential area at Marshall Landing (Carpenter 1967:24). It is not known, however, whether the skeletal remains and artifacts reportedly found at this location relate to the Tamaroa Indian massacre or, instead, are associated with a prehistoric, or a later historic, occupation. The location of archaeological sites in the area indicates that the Calhoun Point area was a common camp and village site in the seventeenth and eighteenth centuries. For example, Henri de Tonty, traveling down the river in October 1686, indicated an Illinois village was located near the mouth of the Illinois River that could have been on Calhoun Point (Tonty 1968:43)

A review of the Government Land Office Records (GLO) plats and survey notes of the original land office survey of 1827 indicates that at that time a fairly broad expanse of level prairie covered a portion of the Deer Plain Terrace at Calhoun Point (Figure 4). The GLO description of the location and character of this prairie fits La Salle's description of the meadow in which he observed the Tamaroa massacre site (Parkman 1931:211-212). The eastern (downstream) edge of this prairie, corresponding, perhaps, to the "farthest verge" of the meadow described by La Salle (Parkman 1931:211), intersects the Illinois River at Marshall Landing (Figure 4), providing further evidence in support of this being the location of the 1680 Tamaroa Indian massacre site (Lopinot 1990:3).

By the latter part of the eighteenth century, the Illinois Confederacy had been weakened and eventually dissolved leaving the vast territory of the Illinois country unclaimed by any native group. According to Carpenter (1967:6) a census conducted by the French in 1736 found only 600 Illinois warriors left in the territory and by 1800 the number had been reduced to 30 warriors (Carpenter 1967:6).

The Illinois territory remained unclaimed after the fall of the Illinois Confederacy and was used by various Native American groups until the influx of American settlers in the early nineteenth century (Johnson 1973). Dominate among the tribes in the Illinois territory were the Sauk and Fox. Conflict and tensions between native groups, the British, and American settlers peaked during the War of 1812. Fearing that the Sauk and Fox would align with the British, a band was "escorted" across the Mississippi River by the U.S. Army, crossing the river approximately 8 miles west of the central portion of the Swan Lake project area (Clifton 1989;

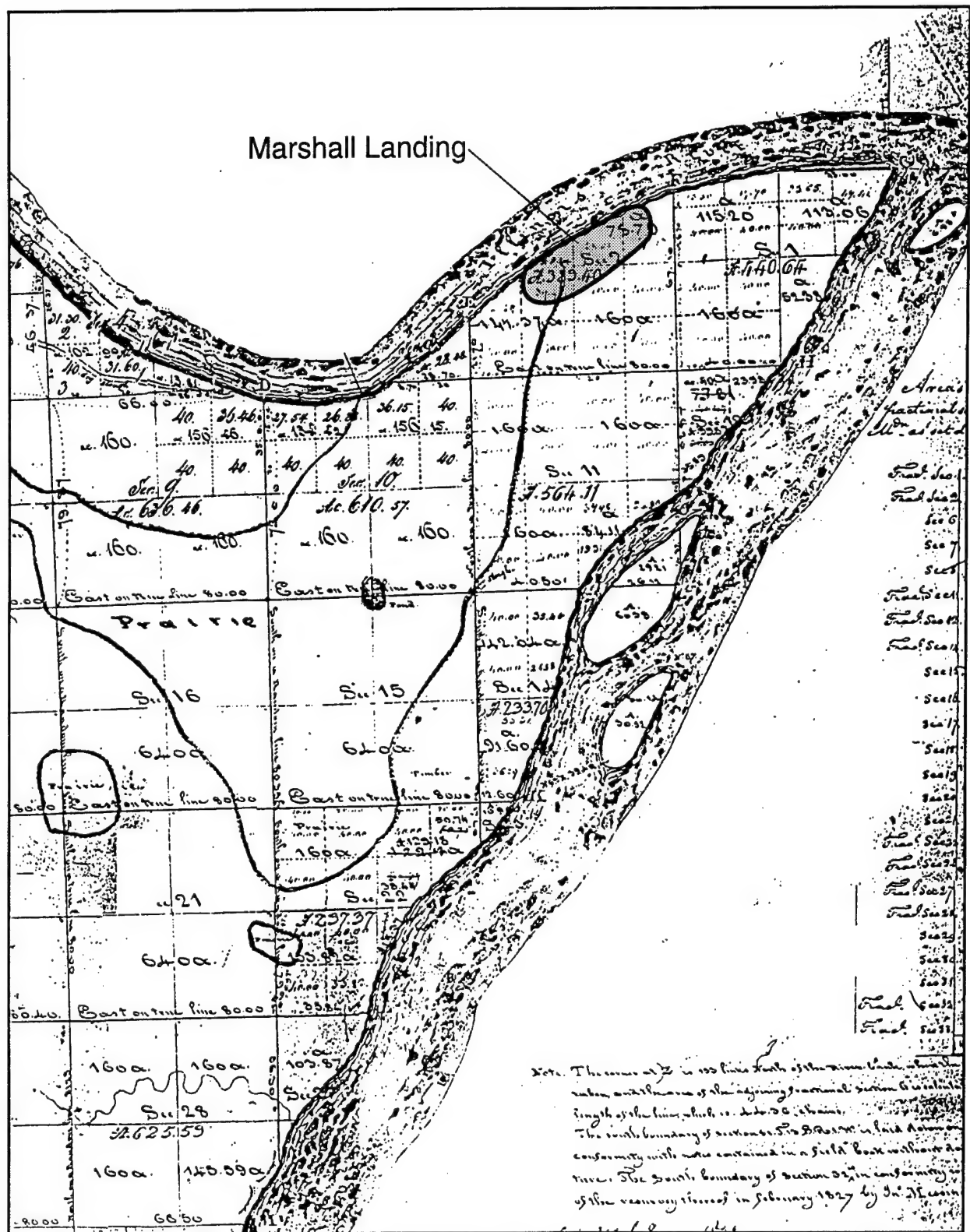


Figure 4. Government Land Office map of Calhoun Point, showing the location of tall-grass prairie in relation to the present location of Marshall Landing.

Temple 1966:106). A fort had been constructed in Missouri in this area, across the Mississippi River from West Point Ferry. In the summer of 1813, between 60 and 80 Indians from the northern part of the state clashed with 13 soldiers who had crossed the river from the fort. The number of Indians killed or wounded is not known, but the only soldier to survive the battle was John Shaw (Carpenter 1967:8). The following summer, another battle took place in the same area between Indians from the north, and soldiers and settlers from the fort. The war party did not attack the local settlers in Calhoun County, as their quarrel was strictly with the settlers and soldiers from the fort. Black Hawk, who later became a prominent figure in the Black Hawk War, is said to have been with the war party.

French trappers were the first Europeans to settle in the Calhoun County area. The first settlement was just above Deer Plain Ferry on the Illinois River. Flooding in 1815 prompted the abandonment of this post and a second settlement was established at Cape Au Gris in the early nineteenth century. This settlement was located at the site of West Point Ferry, in the Richwoods precinct (Carpenter 1967:11). According to Flagg (1838:100), Cape Au Gris, or Grindstone Point, was located near the southernmost point of the Military Tract at the confluence of the Illinois and Mississippi Rivers. It is believed that this settlement was located at, or close to, Auer Landing or Schneider Landing. According to Carpenter (1967:11), there were 20 families farming approximately 500 acres of common fields at the village in 1811. During the war of 1812, the settlers were apparently driven away from the village (Flagg 1838:100), and by 1815, the settlement was abandoned.

American settlement in Calhoun County dates from 1811 with the arrival of Major Roberts. By 1819, there were five settlements in the county (Carpenter 1967:12). Judge Ebenezer Smith arrived in Calhoun County on May 10, 1819. At the time, there was a trading post in the neighborhood operated by a French-Canadian. In furthering the settlement of the neighborhood, Smith is said to have destroyed the trading post in order to free the community from the dangers from "drunken Indians" (Carpenter 1967:13). Large numbers of American settlers began arriving in Calhoun County in the 1820s, and the population continued to increase through the 1830s (Clifton 1989:73). The majority of the early settlers of the county were of English descent, but Germans, Irish, French and Afro-American families also settled in Calhoun County. The first census was taken in 1830, and the county population was placed at 1,092 people, all of whom were white. By 1840, the number of Afro-Americans had increased to 15, 13 males and 2 females (Carpenter 1967:32). The largest increase in the population of the county took place between 1840 and 1860, as a result of an influx of German and Irish immigrants fleeing persecution and hardships in their motherlands.

On January 10, 1825, Calhoun County was incorporated out of Pike County and named in honor of John C. Calhoun, a prominent statesman of the time. Prior to this, the county seat had been at Atlas, but with the establishment of Calhoun County, the county seat was moved to Coles Grove and the name of the community changed to Gilead. The county seat remained at Gilead until 1847, when it was moved to Child's Landing for easier access by the citizens of the county (Carpenter 1967:22, 26). The name of the community was changed to Hardin in honor of Colonel

John C. Hardin, who was killed in the Mexican War leading the first Illinois volunteers (Carpenter 1967:26).

The timber industry was a major factor in the early economic growth of Calhoun County. Based on Government Land Office records, it is estimated that around 1820 approximately 85.6% of Calhoun County was forested (Iverson et al. 1989:8). When steamboats began to travel the Mississippi River and Illinois River, landings sprang up along the river banks where settlers sold firewood to passing steamboats. From these landings, lumber, wheat, and apples were shipped to markets in Alton and St. Louis (Underwood 1975:11). The Mississippi and Illinois Rivers were the economic lifelines for the county. Unlike many other communities, the spread of the railroads had little impact on river trade in Calhoun County. So important were these rivers that Calhoun was the only county in the state left without a rail line (Carpenter 1967:68). By the end of the Civil War, timber production began to decline, but the soils in the uplands of the county and the climate were found ideal for growing apples. The apple industry became the primary employer in Calhoun County, so that by 1930 75% of the employed workers in the county owed jobs to the orchards (Bortz n.d. cited in Clifton 1989:74).

The Swan Lake HREP encompasses a portion of the three and a half million acres of land between the Mississippi River and the Illinois River that was referred to as the "Military Lands" or the "Military Tract." The United States Government had set aside these lands to give to veterans of the War of 1812. Those who had enlisted prior to December 10, 1814 were deeded 160 acres, while those enlisting after that date were deeded 320 acres (Carpenter 1967:13). Much of the Military Tract became the ownership of land speculators in the east who purchased the land from the soldiers. In 1833, for example, only 34 of the 139 tracts of land in Calhoun County sold for taxes were owned by the original assignee (Carpenter 1967:13). Thus, while many tracts of land were purchased at this date, very little settlement took place in the region. Early settlement of the Military Tract was slowed by several factors. First, the region was isolated and in a remote portion of the United States, and, at the time, was considered the Western Territory. Second, Indians still maintained possessions in the region and conflicts between American settlers and the native groups still occurred. Third, while the land survey was begun as early as 1817, the surveys were not completed until 1831, and, thus, large parcels were not available for purchase until that time. Finally, much of the land in the Calhoun Point area is very low and subject to frequent flooding. An early description of Calhoun Point characterizes the area as being ". . . a great body of land subject to inundation . . . The soil of this area is generally fertile; but no dependance can be placed upon the crops, as they are continually exposed to the ravages of the water" (Beck 1923:73).

Throughout the eastern United States during the early 1830s, an increase in land settlement and land speculation led to a dramatic increase in land sales. The adoption by banks of a policy of unlimited credit, together with the inflated value of paper money, had resulted in a false impression of prosperity. This led to a flurry of people purchasing land under the impression that it could be resold for a huge profit (Krenkel 1958:47). During this time, Illinois was swept by a wave of land speculation coupled with a mania for internal improvements. The amount of public

land sold in Illinois increased almost ten fold within two years, from 354,010 acres in 1834 to 3,199,703 acres in 1836. Following the panic of 1837, land sales dropped dramatically and failed to recover until the mid 1850s.

By the latter 1840s land sales again began to increase. Between 1847 and 1855, Congress authorized the issuance of warrants, each good for 160 acres, to soldiers who participated in the Mexican War and the Indian Engagements. These warrants were legally assignable and could be purchased at county seats (Howard 1972:257). As a result, the government received nothing and land speculators invested less than \$1.25 in their land-warrant holdings. This activity was not unusual. Paul Gates, a leading Illinois historian, has found that after 1850, more Illinois land was exchanged for military warrants than was sold for cash (Howard 1972:158).

In 1852 Congress passed the Graduation Act that reduced the price of land that had been for sale for ten years or more. The price of the land was based on how long the land had been available, with the minimum price set at \$.12 1/2 an acre. Taking advantage of the available land, German and Irish immigrants purchased large tracts of ground in Calhoun County, and the county experienced its largest increase in population between 1840 and 1860.

Previous Archaeological Investigations

Two systematic archaeological surveys have been conducted in the project area vicinity. In the early 1970s, a shoreline survey was conducted by the Northwestern University Contract Archaeology Program, Kampsville, Illinois, for the St. Louis District, U.S. Army Corps of Engineers (Farnsworth 1976). The survey covered the Illinois River bank from river miles 1 to 80. The survey consisted of the visual examination of the ground surface along a corridor extending back 300 ft from the river shoreline. No subsurface testing (shovel testing) was conducted, so only visible ground was included in the survey. Two archaeological sites, sites 11-C-152 and 11-C-153, were recorded in the vicinity of the present project area. Site 11-C-152, the Persimmon site, was recorded north of Pump Station #3, near the southern end of the project area. Diagnostic artifacts recovered during the initial site survey, including a Belknap point, lamellar flakes, and a number of "Jersey Bluff-like" sherds, indicate the Persimmon site contains Early Woodland, Middle Woodland, and Late Woodland components (Farnsworth 1976:13, 17; Schroeder 1992:148). Site 11-C-153, the Duck Blind site, was also recorded during the shoreline survey, although this site actually represents a historic Euroamerican component at the Persimmon site.

Because the 1976 shoreline survey (Farnsworth 1976) did not include the complete investigation of the river shoreline between river miles 1 and 80, the site density data obtained during this survey is not apt to reflect the actual density of prehistoric and historic occupations on the natural levees found along the Illinois River. Moreover, the data collected during this survey may not represent small sites associated with ephemeral use of the river edge and, therefore, may lead to misinterpretations of the site-type data for this area. The survey did indicate, however, the likelihood of buried sites being present in the river valley. Cultural material was found eroding

from midden deposits along the shoreline as deep as seven feet below the present ground surface (Farnsworth 1976:55). Thus, areas where no sites were recorded may indicate areas where extensive alluviation has buried sites, rather than indicating those areas that were never utilized.

The only other systematic archaeological survey in the area was conducted by Kenneth Tankersley, Illinois State Museum, for the Illinois Department of Conservation (Schroeder 1992). A total of 115 acres was surveyed on Calhoun Point, in a cultivated waterfowl rest area ("Goose Field") located east of the southern end of the Swan Lake HREP project area. As a result of the survey, five archaeological sites and three isolated finds were recorded. These consisted of site 11-C-190, a multicomponent site containing Archaic, Late Woodland/Mississippian, and post-1850 components, site 11-C-193, a historic site containing a post-1850 component, and three sites, 11-C-191, 11-C-192, and 11-C-194, with nondiagnostic prehistoric components. Both sites 11-C-190 and 11-C-193 were considered to be potentially eligible for the National Register of Historic Places. None of these sites are located inside the Swan Lake HREP project area.

In the course of a recent geoarchaeological study, Hajic (1987) developed a model that evaluates various landform assemblages within the lower Illinois River valley in terms of their potential for containing buried archaeological sites. Four of the landform assemblages identified by Hajic are represented within the Swan Lake HREP project area: flood basins (FB); Illinois River natural levees, recent and relict (NLI); tributary creek alluvial fans, colluvial fans and slopes, and minor stream channels and flood plains (AF); and, Mississippi River bars and chutes, numbered oldest to youngest (M1, M2, and M3)(Hajic 1987, Plate 1).

The Swan Lake and Fuller Lake flood basin (FB) will be impacted by the excavation of one borrow trench and the construction of one interior closure, one lower closure, and two island groups. This landform assemblage is evaluated as having low potential for containing buried archaeological sites within 2.5 meters of the lake bottom, and little or no potential below this depth (Hajic 1987, Plate 5). The southwestern end of the interior closure, and the two boat ramps and associated parking lots and access roads will be located on the alluvial fan landform assemblage (AF). This landform assemblage is evaluated as having high potential for containing buried archaeological sites within 2.5-3 meters of the modern ground surface, low potential from a depth of 2.5-3 meters to a depth of 4.5-5 meters, and little or no potential below a depth of 4.5-5 meters (Hajic 1987, Plate 5). Borrow Areas A-D, the exterior levee, the relocated road, the drainage swale, the northeastern end of the interior closure, and Pump Stations #1 and #2 will be located on the Illinois River natural levee landform assemblage (NLI). This landform assemblage is evaluated as having high potential for containing buried archaeological sites within 3 meters of the modern ground surface, and little or no potential below this depth (Hajic 1987, Plate 5). Pump Station #3 (M1) and Borrow Area E (M2) will be located on the Mississippi River bars and chutes landform assemblages. The potential of these assemblages for containing buried archaeological was not evaluated (Hajic 1987, Plate 5).

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CHAPTER IV. RESEARCH DESIGN AND METHODOLOGY

Introduction

The following research design is guided by the rather diverse yet interrelated variables which are inherent to the practice of cultural resources management. These variables include the contract requirements as stated in the scope of work, topographic and vegetational conditions in the study area, and the level of proposed effort.

Research Design

The general theoretical approach employed by researchers at American Resources Group, Ltd., may be classified within the cultural-ecological tradition in American archaeology. This tradition may be traced to studies of anthropological theorists such as Steward (1955), Sahlins and Service (1960), and Service (1962), and has been developed as an archaeological approach in the writings of Binford (1972), Flannery (1968), Ford (1977), and Watson et al. (1971). Cultural ecologists view culture in systemic terms and regard it as the primary mechanism by which human beings adapt to their environments. Cultures are viewed as open-ended, dynamic systems that change over time in response to environmental changes, biological constraints, and interaction with other cultural systems. Archaeological research carried out in a cultural ecological framework involves reconstructing past cultural systems in their environmental settings, charting the trajectory of change over time, and identifying sociocultural and environmental processes that can explain the change observed during the study of particular cultural systems.

In its broadest sense, archaeological research focuses on how human populations adapted to their particular environments and how the resulting cultural complexes changed through time in response to changing environmental and social conditions. Cultural changes can be inferred from the archaeological record with varying degrees of success through comparative analyses of artifactual remains as manifested by technology, settlement/subsistence systems, human biology, social organization, and ideology. It is acknowledged, however, that an overall rendering of past human organizations cannot be realized due to the limitations of archaeology and the small size of the project area. The information recovered by the survey may offer some information on settlement patterns (site locations) and possibly some limited information on technology (chert procurement and stone tool production) but other questions about extinct cultural systems cannot be addressed.

The research design for the current project was based on the contract requirements as specified in the project scope of work (Appendix A), and on geomorphological, topographical, and vegetational conditions in the study area. In keeping with the primary objectives as specified in the scope of work, this research effort focused on the location and assessment of cultural resources within the project area. The relatively small size of the project area limited the types of research questions asked and the types of archaeological data encountered and that can be recovered from shovel tests.

Prehistoric Sites

For the purposes of the project, a site was defined as a "spatial cluster of cultural features, items, or both" (Binford 1972:46). This definition applies to both prehistoric and historic archaeological sites. Archaeological context may be defined by including any of the following: soil staining, associated fire-cracked rock, ceramics, features, or a concentration of materials within a reasonably definable spatial boundary. Localities designated as sites may be differentiated further into site types. The following prehistoric site type model (after Binford 1980:8-10) will be used for site discussions and interpretation within the project area.

Habitation Sites. Habitation sites contain cultural deposits related to seasonal occupation and may include subsurface features. Organic staining indicative of residential structures and task-specific activities may be represented. Site size is moderate to extensive. Density of cultural debris and diversity of artifact classes are moderate to large. Two kinds of habitation sites may be defined.

Residential Base or Village. These are the hub of subsistence activities, the locus out of which foraging parties originate and where most processing, manufacturing, and maintenance activities take place (Binford 1980:9). Residential base camps may be manifested in the archaeological record as large sites with a high artifact density and a wide diversity of tools and other artifacts. Cultural features are usually present.

Field Camp. A temporary operational center for a task group which maintains itself while away from the residential base and may be expected to be further differentiated according to the nature of the resources to be procured (Binford 1980:10). The task groups may function to procure resources for social groups much larger than themselves; sites may vary considerably, depending upon the size of the group and the nature of tasks to be performed. Subsurface features may be present.

Limited Activity Sites. These sites contain no subsurface features or structures or cultural deposits of substantial integrity related to seasonal occupation on the site. Organic staining is absent. Site size is generally small and they are occupied for only a short period of time. Density of cultural debris and diversity of artifact classes are limited severely due to the extractive nature of the limited activity.

Historic Sites

Historic archaeological sites were treated similar to prehistoric sites. Based on previous investigations in southern Illinois (McCorvie 1987a; McCorvie 1989) and the historic background of the region, three types of historic sites potentially were located within the project area.

Farmstead Complex. This type of site consists of a house and associated outbuildings. House structures were either log or frame. The foundation was generally made of sandstone, limestone, or brick and was either a pier or full perimeter foundation. Outbuildings and facilities that surrounded the house structure within a 15 m radius included the smokehouse, cellar, well, cistern, and privy.

Farmsteads often contain a separate barnyard area located within a 200 m radius of the domestic area. Structures and facilities in this area included the barn, corn crib, paddocks, gardens, and fruit orchards (McCorvie et al. 1989). Located at an even greater distance from the domestic area are the fields, pastures, hog lots, and other agricultural facilities of the farmstead.

Artifacts which are present on farmsteads included nails and other construction materials; brick; sandstone; limestone; earthenware; stoneware; window glass; bottles; canning jars; pressed glass containers; metal objects; toys such as marbles, slate pencils and boards; pipes; buttons; and various domestic items. Ceramics usually represent a sizable percentage of the total number of artifacts with a larger ratio of earthenware to stoneware. A relatively high percentage of earthenware is generally a good indicator of a habitation site. The quantity and quality of artifacts reflect the economic status of the site.

Dump or Discard Locations. These sites originate strictly for the purpose of depositing refuse from other sites. Dump areas generally consist of larger objects such as worn-out machinery parts, portions of demolished outbuildings, and large household items. Gullies, ravines, or steep slopes are likely places for dumps. Smaller items such as broken ceramics are often discarded closer to the activity area.

Hunting/Fishing Camps. These sites represent seasonally occupied camps for either fishing or the hunting of migratory waterfowl. Structures at this type of site may also include blinds, shacks, and other temporary shelters such as lean-tos. The temporary nature of the occupations should be reflected in a restricted artifact inventory. Expected artifact types include personal items such as buttons and pipes as well as faunal remains, liquor bottles, cans, ammunition, and fishing tackle. Site size should be small with few or no subsurface features present.

Research Methodology

The research methodology was designed to meet a series of specific tasks including records search and literature reviews, archaeological field investigations, geomorphological investigations, laboratory analyses, report preparation, and curation of recovered materials.

Records and Literature Review

The objective of the prefield research was to determine if known archaeological sites existed within the project area. Information provided by the Illinois Historic Preservation Agency (IHPA) to the Corps of Engineers, St. Louis District, was consulted to obtain information regarding previously recorded archaeological sites in the project area. This revealed that there are two known prehistoric archaeological sites, sites 11-C-23 and 11-C-152, located in the vicinity of the Swan Lake HREP construction area. Prehistoric site 11-C-23, the Collins site, is reportedly located about 40 m south of the southern end of Borrow Area B, although it appears the site is actually located approximately one mile north of this reported location, well outside the project area. Site 11-C-152, the Persimmon site, was recorded in the course of an Illinois River shoreline survey conducted by the Center for American Archaeology (CAA), Kampsville, Illinois (Farnsworth 1976). Diagnostic artifacts recovered during the initial site survey indicate the site contains Early Woodland, Middle Woodland, and Late Woodland components (Farnsworth 1976:13, 17; Schroeder 1992:148). The Persimmon site was reported to be located in the vicinity of Pump Station #3, but the limits of the site were not well defined. The National Register of Historic Places was studied, and it was determined that for the survey area no sites were currently on the Register nor were there any sites pending nomination for the Register.

Historic Indian artifacts dating to the early eighteenth-century have reportedly been found along the Illinois River shoreline from the mouth of Sixmile Slough to the mouth of Swan Lake. It has been suggested that these artifacts are associated with a village site purportedly occurring at the same location as the 1680 Tamaroa Indian massacre site, which some archaeologists believe is located beneath Swan Lake (Kenneth R. Farnsworth, letter to Debra L. Kimbull, April 10, 1990). Documentary research suggests, however, that the Tamaroa Indian massacre site is probably located outside the project area, at Marshall Landing (Lopinot 1990:3)

Archival sources consulted for information on pre-settlement vegetation in the project area included the original Government Land Office (GLO) survey notes and plats, copies of which are housed at Morris Library, Southern Illinois University at Carbondale. As a part of the archival research, old maps of the region were studied for any indication of historic sites that might have been plotted there upon. Cartographic sources examined include Army Corps of Engineers river channel maps (1904) and United States Geological Survey topographic maps (1931, 1939) of the project area. Published sources reviewed for background historical information include a history of seventeenth-century French exploration of the Illinois River Valley (Parkman 1879), a history of Calhoun County, Illinois (Carpenter 1967), and cultural resource management reports of earlier archaeological surveys in the project area vicinity (Farnsworth 1976; Schroeder 1992). Recent geoarchaeological studies conducted within the lower Illinois River valley were consulted in order to obtain information regarding the potential occurrence of buried archaeological sites in the project area (Hajic 1987) and the impact of bank erosion on sites located along the river (Warren 1987).

Field Investigations

The archaeological survey was conducted for a period of nine days between October 10 and 27, 1994. The total area contained in the project area is approximately 95 acres.

Project Construction Impacts. The project area consists of the construction corridors of a proposed exterior levee, a relocated road, a drainage swale, and a pump station access road, as well as the proposed locations of five borrow areas, three pump stations and associated channels, two boat ramps and associated parking lots and access roads, and the two (land) ends of an interior closure (Sec. 2.3.1-2.3.8, S.O.W., Appendix A).

Exterior Levee. The proposed exterior levee will consist of a 8.9-mile-long (14.2 km), low-profile earthen levee paralleling the Illinois River shoreline (Figures 2, and 3). A 2,000-foot-long (606 m) section of the levee will consist of a stone-capped closure that will cross open water between Swan Lake and the Illinois River (lower closure)(Figure 3); this portion of the proposed levee does not require survey. The maximum width of the levee construction corridor is 60 feet (18.2 meters). The maximum depth of ground disturbance associated with the construction of the exterior levee is 1-2 feet (30-60 cm).

Relocated Road. A 3,300-foot-long (1,000 m), 25-foot-wide (8 m) relocated road will be constructed from the proposed exterior levee to an existing IDOC boat ramp located on the northeastern shore of Fuller Lake (Figure 2). The maximum depth of ground disturbance associated with the construction of the road is 6 inches (15 cm).

Drainage Swale. A 2-foot-deep (60 cm) swale will be constructed across an agricultural field at the northern end of project area to improve drainage (Figure 2). The 1,300-foot-long (393 m), 30-foot-wide (9 m) drainage swale will be located immediately north of, and parallel to, the exterior levee. The final alignment of the drainage swale and the extreme northern end of the exterior levee had not been identified at the time of survey, so an area measuring approximately 200 ft x 2,000 ft (121 m x 606 m) was investigated in this portion of the project area (Figure 2).

Borrow Areas. Five potential borrow areas have been identified within the project area: Borrow Areas A-C are located at the north end of the project area, Borrow Area D is located on the peninsula between Swan Lake and the Illinois River, and Borrow Area E is located near the southeastern edge of Swan Lake (Figures 2 and 3). All of the borrow areas are located in agricultural fields, although those containing Borrow Areas A, D, and the southern end of C have been abandoned and are now covered by second-growth forest (willow and maple). The irregularly-shaped borrow areas, totaling approximately 25 acres (10.1 ha), will be impacted to a maximum depth of 5 feet (150 cm).

Pump Stations. Three pump stations and associated channels will be constructed, two on the wooded peninsula between Swan Lake and the Illinois River (Figure 2 and 3), and the

third on the wooded terrace escarpment east of the mouth of Swan Lake (Figure 3). Each pump station will disturb a 600-foot-long (182 m), 90-foot-wide (27 m) area to a maximum depth of 12 feet (360 cm). Two channels will be excavated to a maximum depth of 12 feet (360 cm) at each pump station, one leading to the Illinois River and the other to Swan Lake.

Boat Ramps. Two boat ramps with parking lots and access roads will be constructed, the northern ramp on the west shore of Middle Swan Lake (Figure 2) and the southern ramp on the western shore of Lower Swan Lake (Figure 3). Each boat ramp and parking lot will disturb a 200-foot-long (61 m), 200-foot-wide (61 m) area to a depth of approximately 6 inches (15 cm). The access road to be built to the northern ramp will be approximately 1,000 feet (303 m) long, and the road to the southern ramp will be 1,200 feet (364 m) long (Figures 2 and 3). Both roads will disturb a 12-foot-wide (360 cm) area to a depth of .5-2 feet (15-60 cm) along existing, two-track dirt roads.

Interior Closure. The interior closure separating Lower and Middle Swan Lake will be constructed across open water. Survey is required for only the two ends of the interior closure that will be located on land (Figures 2 and 3).

Field Survey. Complete survey coverage was accomplished by a three-person field party and a geomorphologist. Survey techniques were implemented in accordance with sections 4.2-4.9 of the project scope of work (Appendix A).

Geomorphological Investigation. The geomorphological investigation of the project area was carried out prior to the initiation of the archaeological survey. The geomorphological investigation was conducted to determine the depth of the post-settlement alluvium (PSA) deposit within the project area, and to investigate the potential for buried cultural resources at locations where the maximum depth of construction impact may extend below these recently-deposited sediments. The methods employed during the geomorphological investigation, which included a combination of soil coring and backhoeing, are described in detail in Chapter V.

Archaeological Investigation. The archaeological survey was guided by the results of the geomorphological investigation. The field survey was primarily restricted to those portions of the project area where the maximum depth of construction impact will extend below the PSA deposit, although a portion of the Illinois River shoreline, outside the project area, where early eighteenth-century Indian artifacts have reportedly been found, was also examined. The field investigation was carried out using a variety of field techniques, including visual examination of the river shoreline, systematic surface survey, systematic screened shovel testing, soil-column excavations within deep-testing trenches, and examination of the walls of backhoe trenches. These techniques are outlined below.

Visual Examination of River Shoreline. Historic Indian artifacts dating to the early eighteenth-century have reportedly been found along the Illinois River shoreline from the mouth of Sixmile Slough to the mouth of Swan Lake (Figures 2 and 3) when the river is below

normal pool elevation (419' AMSL) (John White to Suzanne Harris, personal communication, July 19, 1994). Although this area is located outside the project area, it was visually examined during the present survey. The Illinois River pool level was 419.5' AMSL at the time of the survey, however, so no shoreline exposures were observed.

Systematic Surface Survey. Portions of the project area containing little or no PSA and having ground surface visibility in excess of 25% were investigated through systematic surface survey. These areas include Borrow Area E, the eastern half of the construction corridor of the Pump Station #3 access road, and the Swan Lake and Illinois River shorelines in the vicinity of Pump Station #3 (Figure 3). Borrow Area E is contained within an agricultural field that was planted in 2-inch-high winter wheat at the time of survey, and the eastern half of the access road construction corridor is located in a field that was planted in 8-foot-high corn. Ground surface visibility ranged from approximately 50% to 75% in the well-washed cultivated fields, and approached 100% along the Swan Lake and Illinois River shorelines.

Surface survey was conducted along parallel transects spaced 10 m apart in Borrow Area E, and along two transects spaced 5 m apart within the 10-foot-wide access road construction corridor. The Swan Lake and Illinois River shorelines were surveyed along two transects spaced 1-2 m apart.

With the exception of cracked rock, every prehistoric artifact observed on the surface during survey was collected. A sketch map showing site limits and any topographic and cultural features that might be used to relocate the site was prepared for each site recorded.

Systematic Shovel Testing. Portions of the project area containing shallow PSA deposits, but having less than 25% ground surface visibility, were investigated through systematic shovel testing. These areas include the construction area of Pump Station #3 and the western half of the construction corridor of the Pump Station #3 access road (Figure 3). The Pump Station #3 construction area is located in a wooded area, and the western half of the access road construction corridor is contained within a recently-harvested soybean field. Shovel tests were excavated on a 10 m grid within the Pump Station #3 construction area, and at 10 m intervals along a single transect within the western half of the access road construction corridor.

Shovel tests are holes approximately 35-45 cm in diameter that are dug to a depth sufficient to observe culturally undisturbed soils. Excavated fill was screened through 1/4 in. mesh, and each shovel test was backfilled after its contents were inspected and recorded. Pacing was used to control the intervals between transects and shovel tests.

Recovered artifacts were bagged by individual shovel test in order to obtain information on artifact frequency across the site. A sketch map showing the locations of positive and negative shovel tests, the site limits, and any topographical and cultural features that might be used to relocate the site was prepared for each of the investigated sites.

Soil-column Excavation. A total of 41 deep testing backhoe trenches was excavated within three of the borrow areas in order to investigate buried soils identified within the construction impact zone during the geomorphological investigation. Each of the trenches was approximately two meters wide and three meters long. Thirty of the deep testing trenches (Tests 1-30) were excavated in Borrow Area D, three (Tests 31-33) were excavated in Borrow Area B, and eight (Tests 34-41) were excavated in Borrow Area C (Figures 2, 5, and 6). In each of the deep testing trenches, a 25 cm² column of soil was excavated from a depth of 60 cm below surface (BS) to a depth of 150 cm BS. In addition to a 25 cm² soil column, a 50 cm x 50 cm test unit was excavated from a depth of 115 cm BS to a depth of 150 cm BS in Test 13 (Figure 5). Each soil column, and the 50 cm x 50 cm test unit placed in Test 13, was excavated in 10 cm levels, the fill was screened through 1/2 in. mesh, and recovered artifacts were bagged by trench, and by soil-column (or test unit) level.

Examination of Trench Walls. The walls of the 10 backhoe trenches excavated during the geomorphological investigation (Figure 5) and the 41 trenches excavated during the archaeological survey, were trowelled and carefully examined before being backfilled. The below-surface depths of cultural material identified in trench walls were recorded, and recovered artifacts were bagged by trench.

Laboratory Analysis

This task consisted of a comprehensive analysis of recovered artifacts and other site data at the facilities of American Resources Group, Ltd., Carbondale, Illinois. Recovered materials were washed, sorted, and cataloged. Prehistoric and historic materials were identified according to material, manufacture, and function.

Prehistoric Lithic Analysis. After lithic materials were washed and labeled, they were sorted into raw material types and tool and debris categories. Chipped-stone artifacts from each site were sorted into one of five different chert type categories; then, they were sorted into one of 13 different tool and debris categories.

Chert Type Analysis. Chert type identification was based upon macroscopic inspection of artifacts in conjunction with an extensive comparative collection of geologic samples collected from source areas (Koldehoff 1986). Chipped-stone artifacts were sorted into five chert types (discussed below) on the basis of color, texture, inclusions, and form. Chert types were quantified by count and weight, with weights rounded to the nearest 0.1 of a gram. Chert type descriptions are presented below.

Burlington. Burlington chert is derived from the Burlington Limestone of the Lower Valmeyeran Series of the Mississippian System. The Burlington Formation is rich in chert and is widely exposed along the Mississippi River and the Illinois River north of St. Louis, Missouri. Burlington chert, on average, is medium- to high-quality, white to light gray in color, and occurs as residuum and as bedded layers in limestone.

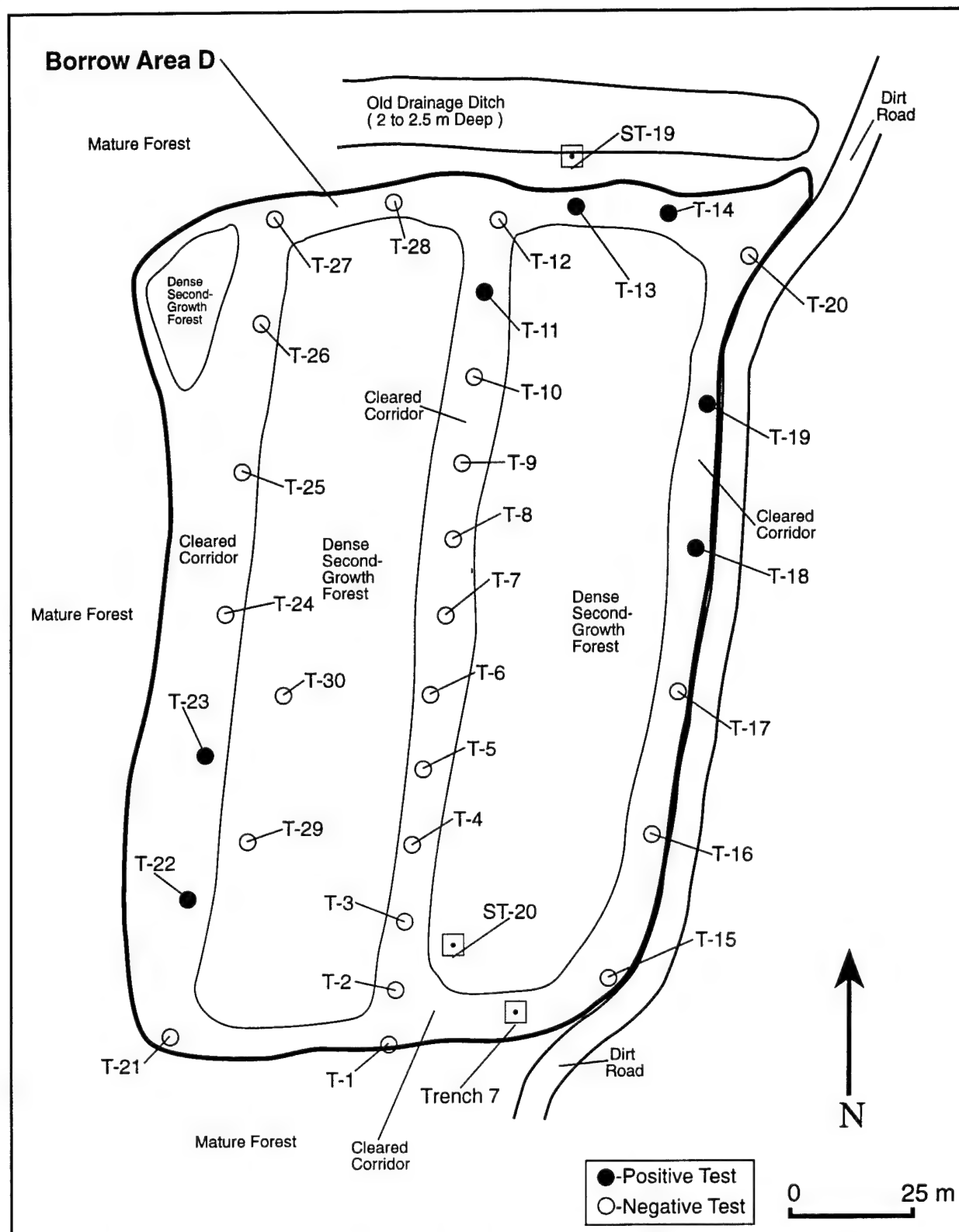


Figure 5. Deep-testing trenches T-1 – T-30, soil tests ST-19 and ST-20, and Trench 7 within Borrow Area D, Swan Lake HREP.

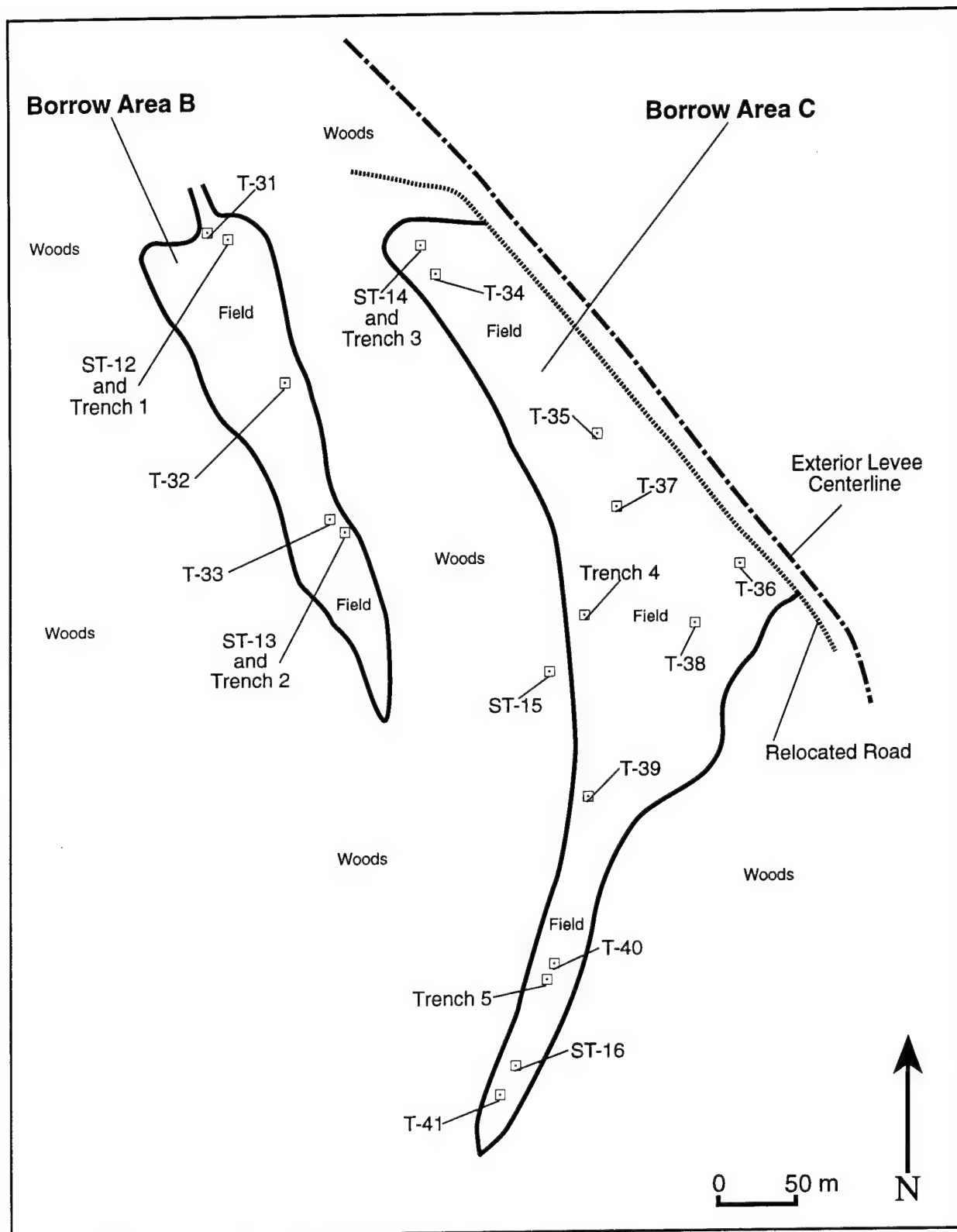


Figure 6. Deep-testing trenches T-31 – T-41, soil tests ST-12 – ST-16, and Trenches 1-5 within Borrow Areas B and C, Swan Lake HREP.

St. Louis Common. St. Louis Common chert derives from the St. Louis Formation of the Upper Valmeyeran Series of the Mississippian System. This medium- to high-quality chert is dark to light gray in color, has a smooth texture, and occurs in bedded form and as blocky stream gravel. The most likely sources of the St. Louis Common chert identified in the site collections are the creeks draining the uplands of extreme southern Calhoun County (3-6 miles southwest of the project area), an area underlain by Upper Valmeyeran Series formations (Willman et al. 1967).

Indeterminate. Artifacts placed in this category include unusual variants that could not be duplicated in the comparative collection.

Technological and Functional Analysis. Observations on use wear and morphology were used to sort chipped-stone and groundstone tools and debris into 14 different categories. The categories are quantified by count. A 10x hand lens was used to examine the edges and surfaces of chipped-stone artifacts. Admittedly, this approach is not as precise as when high magnification is employed (e.g., Keeley 1980), but the goals of the analysis were simple: (1) separate tools from debitage, and (2) place tools into general technological and functional categories. Debitage was separated into categories on the basis of specific attributes such as amount of dorsal cortex, degree of platform faceting and lipping, flake shape and curvature, and overall size. Tool and debitage analysis was aided by prior experiments in stone tool production and use. Materials from these experiments were on hand for comparative purposes.

Cores. A core is any cobble or piece of chert from which one or more flakes have been removed but which has not been shaped into a tool or used extensively for a task other than that of a nucleus from which flakes have been struck. Cores range from chert cobbles or chunks that have had one or more flakes removed in a random fashion (amorphous cores) to highly formalized prepared cores that produce standardized flakes (conical or blade cores). Tested cobbles are also placed in this category; these artifacts are raw pieces of chert that have had one or two flakes removed to test the knapping quality of chert.

Primary and Secondary Decortication Flakes. Amount of cortex is the distinguishing characteristic of these categories. Flakes and sizable flake fragments with greater than 50% dorsal cortex were placed within the primary decortication category, and those with 25-50% dorsal cortex were classified as secondary decortication flakes. Primary and secondary decortication flakes represent the first series of flakes detached from a nodule or cobble.

Tertiary Flakes. Flakes within this category possess no more than 25% dorsal cortex and do not exhibit attributes typical of biface thinning and retouching (resharpening) flakes. Tertiary flakes tend to be larger and more flattened in curvature than biface flakes, and they generally have irregularly shaped platforms with less than four facets. Tertiary flakes are by-products of the early stages of biface reduction as well as by-products of simple flake-tool production.

Biface Thinning and Retouching Flakes. Flakes in these categories exhibit attributes indicating their removal during the later stages of biface production (Biface-1 Flakes) or during biface maintenance (Biface-2 Flakes). Biface flakes possess platforms with an elliptical shape, multiple facets (four or more), lipping, and acute angles. The platforms are minute sections of what was the edge of the biface. Biface-1 flakes are substantially larger and more curved than biface-2 flakes.

Broken Flakes. Flake sections that can not be readily identified as one of the above flake types were considered broken flakes. Flakes may be broken during any stage of reduction or by post-depositional factors such as trampling.

Angular Fragments. Chert fragments within this category include angular chunks and small splinters. These fragments are produced during stone tool manufacture, particularly if (1) poor quality (e.g., internally fractured) chert is used, (2) bipolar reduction is employed, and (3) lithic items are intensively reworked or recycled.

Informal Flake Tools. Flakes placed within this category functioned primarily as cutting and light-weight scraping tools with little to no prior modification. They are expedient flake-tools made from tertiary flakes, other flake types, as well as shatter.

Formal Flake Tools. Included within this category are all formalized and specialized flake tools--endscrapers, sidescrapers, graters, denticulates, and notches or spokeshaves. Depending upon degree of modification, some of these tools could be considered expedient flake-tools, but they are placed here because they are more specialized in their morphology (and inferred function) than the simple flake knives and scrapers in the previous category.

Projectile Points/Hafted Knives. These formal tools were predominantly designed to be hafted, and they functioned as projectile points and/or knives. Included in this category are hafted bifaces that were recycled into hafted scrapers. Points were assigned to previously-defined point types when sufficiently intact to allow classification. The point type descriptions used to classify points were obtained primarily from Justice (1987).

Unspecified Bifaces. Nondiagnostic fragments of bifacial flaked tools were placed in this category, for example, distal tips and midsections of projectile points.

Cracked Rock. Cracked rocks are fragments of sandstone bedrock or glacial cobbles of igneous/metamorphic rock that were fractured due to repeated exposure to thermal extremes. These rocks may have functioned as hearth stones or agents of heat retention in culinary activities such as stone boiling or steaming.

Prehistoric Ceramic Analysis. Many of the prehistoric ceramics recovered during the present investigation are small, eroded body sherds, but all are diagnostic of Woodland period occupations. The prehistoric ceramics were sorted into general categories defined in terms of method of tempering, exterior surface treatment, and relative thickness. Two types of ceramic tempering were observed in the collections: grit tempering, and grit/grog tempering. The kinds of surface treatment present include cordmarking and plain smoothing. Three categories were used in sorting the sherds by relative thickness: thick, moderately thick, and thin.

The data obtained from the ceramic analysis was used to assign the occupations represented at the investigated sites to general cultural periods (e.g., Early Woodland or Late Woodland). In some instances, decorative features, variations in the method of exterior surface treatment, and/or rim form also permitted sherds to be assigned to previously defined ceramic types, and, in turn, related to specific cultural phases.

Historic Artifact Analysis. Historic material was identified according to material, manufacture, and function. Diagnostic material was identified and dated by the use of appropriate references. For ceramic identification and temporal affiliation, classifications and chronologies formulated by Brown (1982), Lofstrom (1976), Majewski and O'Brien (1984); McBride (1984), Price (1979), South (1977), and Wegars and Carley (1982) were utilized. Glass identification and temporal affiliation followed studies by Deiss (1981), Lorrain (1968), and McKay (1979). Other references also were utilized in the functional and temporal identification of items other than ceramics and glass (e.g., Nelson 1968). The following categories were employed for the analysis of historic materials.

Ceramics. The initial identification was of ware type such as pearlware, whiteware, ironstone, porcelain, yellow ware, stoneware, coarse earthenware, or redware. Ironstone identification is problematic in historic artifact analysis; therefore, for this analysis it was defined as a high fired refined earthenware which does not exhibit porosity when touched to the tongue, can have a "cold" grayish color to the paste, and/or is identified as "ironstone" on a maker's mark. Separation of pearlwares from whitewares, also problematic, was based on the decorative type in conjunction with a bluish cast to the glaze color.

Decorative treatment was noted for all of the ceramics and, where possible, temporal periods were assigned. Morphological attributes relating to function were identified where possible.

Glass. Glass making underwent a "revolution" of change during the nineteenth century, resulting in numerous identifiable temporal markers. These manufacturing characteristics and their respective temporal ranges were identified for bottle/jar, tableware, window, and miscellaneous glass. The color and function of the glass items also were noted. Bottle glass, in particular, was analyzed according to Deiss' (1981) classification, terminology, and definitions.

Metal. These items were identified as to type of material (e.g., iron/steel, brass/copper, lead, tin, zinc, etc.) and function (e.g., wagon hardware, tools, nails, cutlery, etc.). The technique of manufacture was identified, where possible, especially in the identification of nail types (e.g., early machine-headed machine cut, modern machine cut, and wire nails).

Construction Materials/Minerals. This category includes brick, mortar, cement, sandstone, limestone, cinders/clinkers, and other minerals not necessarily used in construction. Aside from the basic identification of the type of materials, counts and weights of each type were noted.

Rubber/Synthetics. This category includes rubber items and those manufactured from synthetics such as vulcanized rubber, celluloid, bakelite, and the more recent thermoplastics. Items were identified as to material and function.

Specialized Analysis. Two soil samples were collected from Trench 6, and a wood charcoal sample was collected from Trench 8, during the present investigation. These samples were submitted to Beta Analytic, Inc., Miami, Florida, for radiocarbon dating.

Curation

All artifacts or cultural materials collected during this project, as well as the project notes, photographs, and other data generated during the performance of these contract services, are being temporarily curated at American Resources Group, Ltd. This allows access to these materials during the analysis and report writing stages of this project. The St. Louis District has a curation agreement with the Illinois State Museum, Springfield, and all materials from the project will be curated at that facility.

CHAPTER V. GEOMORPHOLOGICAL INVESTIGATION

Introduction

This chapter describes the results of geomorphological investigations conducted at the Swan Lake HREP during the present survey. The purpose of the investigation was to determine the relative ages of surfaces within the project area, and to evaluate the potential of those surfaces for containing cultural resources.

Quaternary History

The chronology of upper Mississippi/Illinois Valley drainage events during the Pleistocene remains obscure. During the early Pleistocene, the middle reach of the ancient Mississippi River followed the same general course as the present Illinois River from Hennepin to Peoria and southward toward St. Louis. Later, drainage patterns of the ancient Mississippi/Illinois system changed during Illinoian glaciation. These changes diverted the ancestral Mississippi/Illinois drainage westward. Following Illinoian glaciation, drainage reverted back through the Princeton Bedrock Valley and into the Illinois River Valley. Studies conducted by Wickham (1980) and Linebeck (1979) indicate that possibly six to seven glacial/interglacial fluctuations occurred between 500,000 and 120,000 BP (Linebeck 1979). Following these events, the Sangamonian interglacial stage is generally thought to have begun after the last Illinoian glaciation around 125,000 BP and continued to about 60,000 BP.

The oldest Wisconsinan aged deposits found in the lower Illinois River Valley include a loessal deposit known as the Roxanna Silt (Follmer et al. 1979). The loess was deposited between about 45,000 - 30,000 BP. In places, a weak Farmdalian Soil has been developed in the silt. The Farmdalian Soil, which developed between about 22,000 and 28,000 BP, is a time stratigraphic marker and has been recognized at other midwest locations (Anderson 1986, Anderson 1991).

During the Wisconsinan, the ancient Mississippi drainage through the Illinois Valley was abandoned. By about 20,000 BP, the Mississippi was finally diverted to its present course through the Port Byron and Andalusia Gorges south of Clinton, Iowa.

Following permanent Mississippi River diversion from the Illinois River Valley, Woodfordian glacial advances covered the upper portion of the Illinois Valley. The pattern of the Woodfordian moraines in Illinois indicates a minimum of 32 episodes of moraine building in an interval from 14,000 to 20,000 BP (Willman and Frye 1970). During moraine building episodes to the northeast, closer to Chicago, drainage from major glacial lobes (Lake Michigan Lobe,

Saginaw Lobe, and the north side of the Erie Lobe) was discharged into the Illinois River system. These discharges were known as the Kankakee Flood where existing valleys and outlets were inadequate to accommodate the high magnitude flows.

Woodfordian glaciers reached the Peoria area around 19,000 BP (Follmer et al. 1979). The maximum extent of Wisconsinan glaciation extended through central Peoria and Tazewell counties to a point north of Swan Lake. To the east of these counties lies the Bloomington Morainic system with several different till members. To the southwest of the Bloomington Moraine, large outwash deposits are present in the Illinois River Valley. The outwash formed a series of complex terraces that now lie above the modern floodplain. Eolian reworking and deposition of fine sand took place during the waning stages of glaciation and formed a complex system of dunes (Parkland Sand). These dunes are recognized along portions of the Illinois River Valley between Pekin, Illinois, and the Swan Lake project area.

Ice had withdrawn from the headwaters of the drainage systems affecting Illinois by the end of the Woodfordian. However, the Illinois system was still receiving periodic discharges from the Great Lakes. Major river systems, including the Illinois, ceased valley aggradation in favor of valley incision and floodplain abandonment during the Holocene. The result of this event exposed terraces along the Illinois River Valley margins.

Methods

The geomorphological investigation consisted of a combination of soil coring, river bank inspection, and backhoe trenching. Locations chosen for coring were generally non-randomly selected. Cores were advanced somewhat systematically along the length of the construction corridor of the exterior levee to provide an overall picture of the distribution of PSA and underlying native soils, and one or more cores were advanced in the construction area of each of the borrow areas, pump stations, and boat ramps in order to determine whether construction will impact native soils having the potential to contain cultural materials. Topographic and vegetational variables also were considered in the selection of coring locations.

Topographically higher areas were selected for coring because these areas are more likely to contain better-drained, older surfaces capped by thinner PSA deposits than are low-lying areas. Elevation varies by no more than a couple of feet across most of the project area, so the higher areas observed in the field are not identifiable on USGS topographic maps.

Areas containing hardwood forests usually indicate relatively slow vertical accretion, less PSA, and better-drained conditions. Hardwoods such as oak, walnut, hickory, green ash, and elm are less tolerant to rapid sedimentation and long term inundation than are floodplain species such as cottonwood, willow and silver maple. These hardwood locations, which are often topographically higher, were selected to be tested.

Thirty four "JMC" 1 m sampling tube cores of 1/2" diameter were advanced and described at 34 soil testing (ST) locations (Figures 7, 8, and 9). Most of the cores were advanced to depths of 180-240 cm, but those advanced in areas where deeper construction impacts are proposed were extended to greater depths. Only two Illinois River bank exposures were observed inside the project area, one within the proposed river channel of Pump Station #1, and the other within the proposed river channel at Pump Station #2. Little information was obtained from the inspection of these exposures as the depth of the PSA deposit exceeded the height of the river bank at both of these locations. One prominent bank exposure was examined during this investigation, but this exposure is located outside the project area (Figure 7).

Ten backhoe trenches were excavated during the geomorphological investigation in order to conduct more detailed examinations of native soils located within the construction impact zone (Figures 7 and 9). All backhoe trenches were excavated to the maximum depth of construction impact, except those that began filling with groundwater above this depth.

The depth of the PSA deposit identified in each of the soil cores, backhoe trenches, and the bank exposure, as well as data relevant to characterizing soils encountered below the historical deposits, was recorded, and each of the soil testing, trenching, and river bank inspection locations was photographed and plotted on a U.S.G.S. topographic map. The recorded depths of the PSA deposits identified at these locations are presented in Table 1. Soils were described in terms of color, texture, structure, consistency, sorting, special features (roots, pores, voids, mottling, gleying, concretions, organics, clay skins), effervescence and/or pH, and horizon boundary. The colors of the deposits were determined with a Munsell color chart. Soil reaction was determined through application of a weak 14% hydrochloric acid solution. Vegetation, depth to the water table, and total core depth were recorded at each location. The profiles were described according to taxonomic nomenclature normally used for midwest Quaternary studies. Detailed descriptions of the soils observed in each of the soil cores, backhoe trenches, and the river bank exposure are presented in Appendix B.

Results

Two different-aged landscapes are represented in the project area: the early and early to mid Holocene surface, and the late Holocene to historic surface. The early and early to mid Holocene surface lies at the southern end of the project area, between Pump Station #3 and Borrow area E (Figure 9), and at the extreme northwestern portion of the project area (Figure 7). The remainder of the project area appears to be of late Holocene to historic in age (Figures 7, 8, and 9). The following discusses the different surfaces and locations.

The Early to Mid Holocene Surface

The early to mid Holocene surface was identified at soil testing locations ST-30 - ST-32 and Trench 10 (Figure 9). ST-6 appears to be on a poorly-drained, early to mid Holocene swale located in the extreme northwestern portion of the project area. The Argillic (clay enrichment)

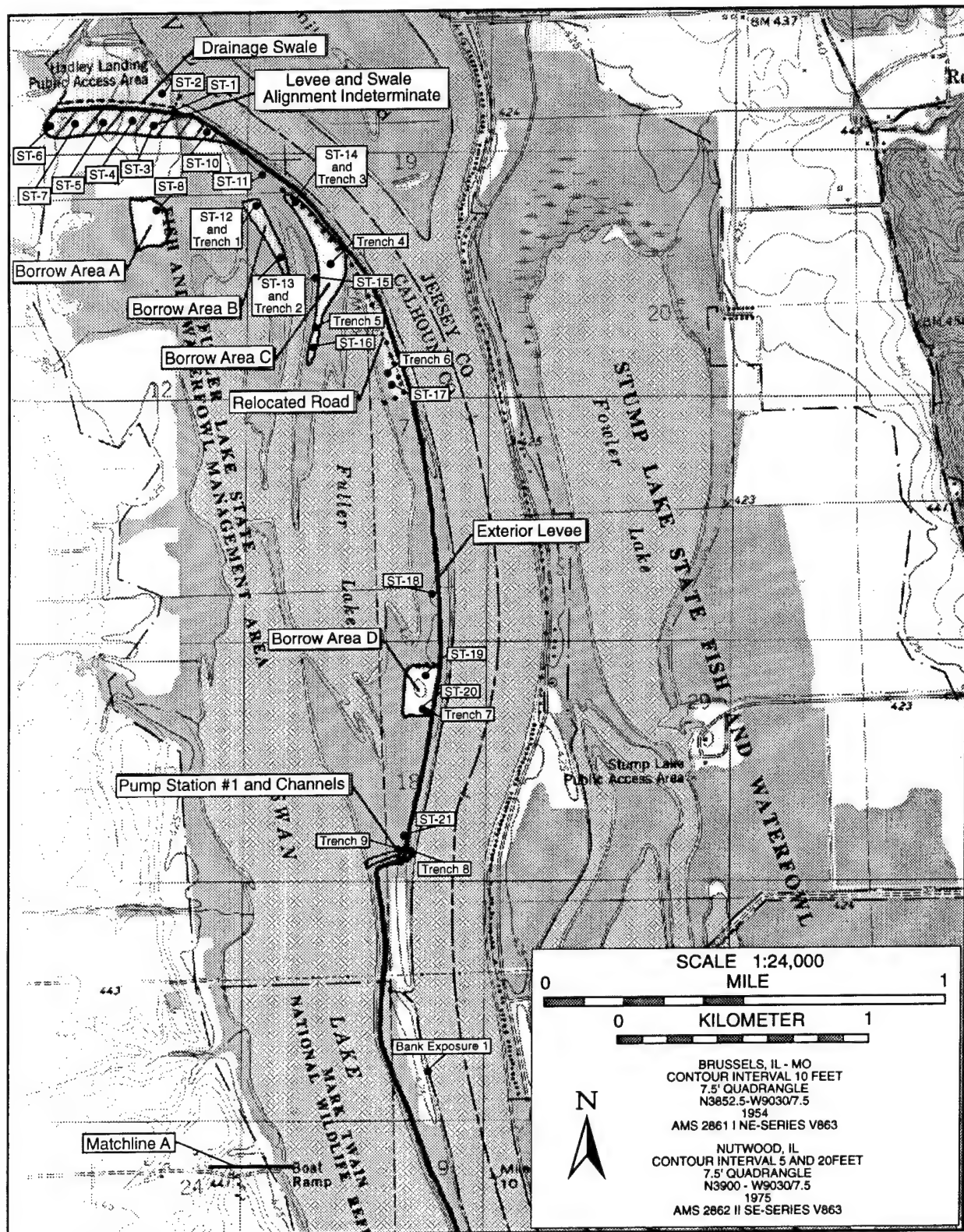


Figure 7. Soil testing (ST) locations ST-1 – ST-21, Trenches 1–9, and Bank Exposure 1 within the Swan Lake HREP.

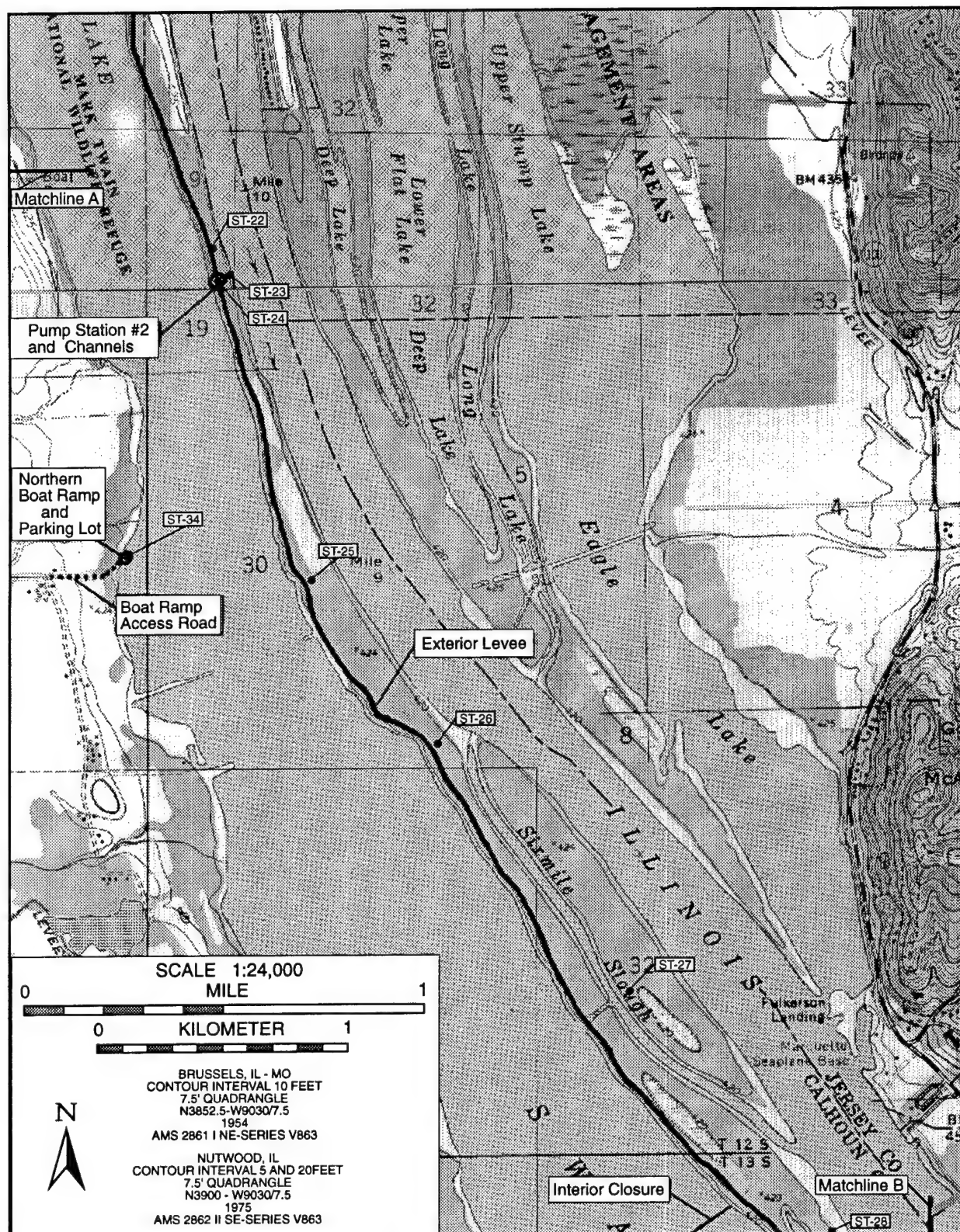


Figure 8. Soil testing (ST) locations ST-22 – ST-28 and ST-34 within the Swan Lake HREP.

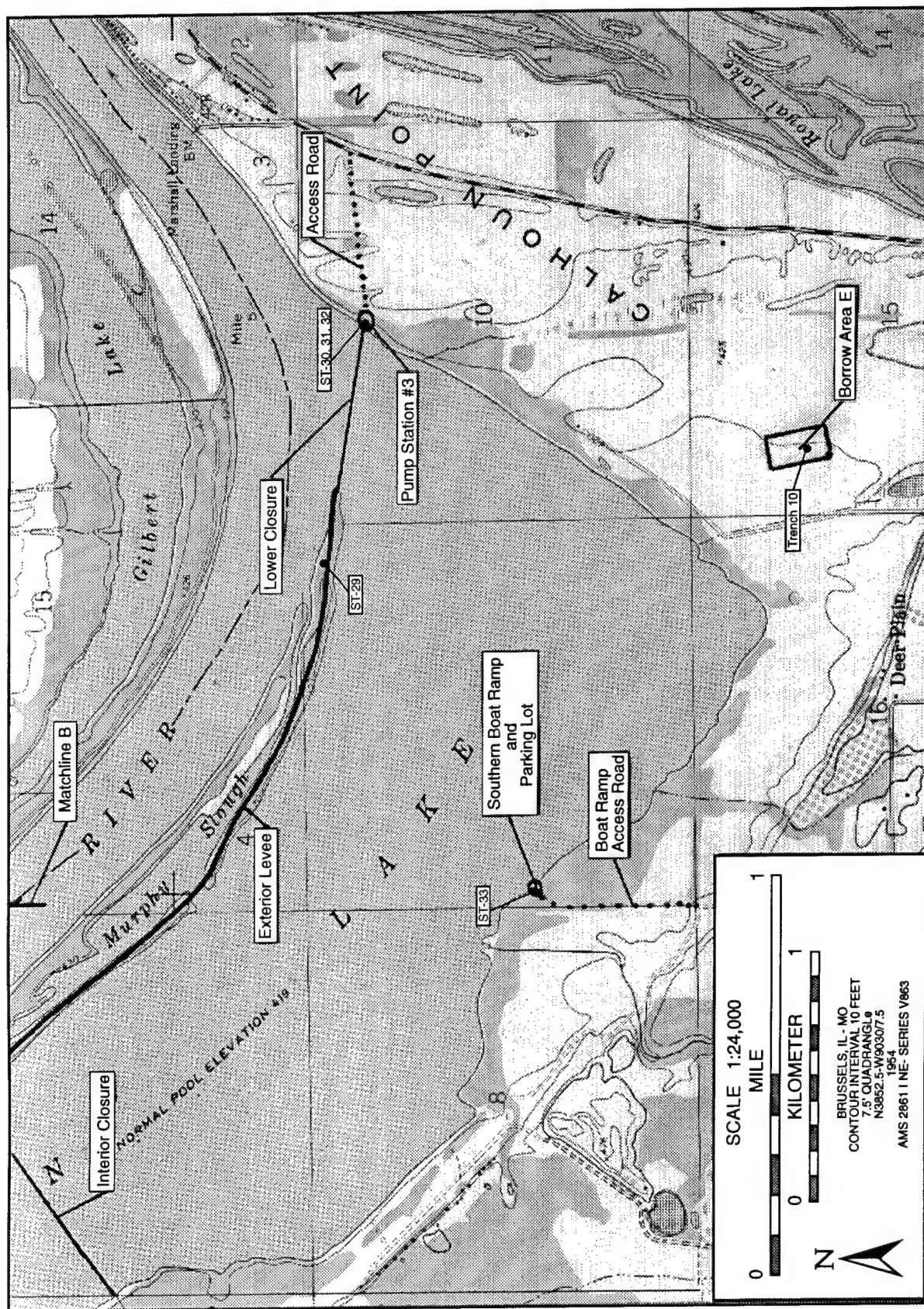


Figure 9. Soil testing (ST) locations ST-29 – ST-33 and Trench 10 within the Swan Lake HREP.

Table 1. Depth of PSA Identified at Soil Testing (ST) Locations,
Backhoe Trenches and Bank Exposures, Swan Lake HREP.

Designation	Project Location	Depth of Construction Impact (cm)	Depth of PSA Deposit (cm)
ST-1	Exterior Levee (469 + 00)	60	190
ST-2	Exterior Levee (472 + 00)	60	90
ST-3	Exterior Levee (472 + 00)	60	100
ST-4	Exterior Levee (475 + 00)	60	85
ST-5	Exterior Levee (480 + 00)	60	70
ST-6	Exterior Levee (485 + 00)	60	50
ST-7	Exterior Levee (482 + 50)	60	80
ST-8	Borrow Area A	150	150
ST-9	Borrow Area A	150	165
ST-10	Exterior Levee (464 + 50)	60	160
ST-11	Exterior Levee (452 + 25)	60	130
ST-12	Borrow Area B	150	100
Trench 1	Borrow Area B	150	80
ST-13	Borrow Area B	150	65

Table 1. Continued. Depth of PSA Identified at Soil Testing (ST) Locations,
Backhoe Trenches and Bank Exposures, Swan Lake HREP.

Designation	Project Location	Depth of Construction Impact (cm)	Depth of PSA Deposit (cm)
Trench 2	Borrow Area B	150	65
ST-14	Borrow Area C	150	80
Trench 3	Borrow Area C	150	70
Trench 4	Borrow Area C	150	70
ST-15	Borrow Area C	150	130
ST-16	Borrow Area C	150	50
Trench 5	Borrow Area C	150	60
ST-17	Exterior Levee (419 + 00)	60	90
Trench 6	Exterior Levee (418 + 00)	60	80
ST-18	Exterior Levee (390 + 50)	60	110
ST-19	Borrow Area D	150	120
ST-20	Borrow Area D	150	60
Trench 7	Borrow Area D	150	70
ST-21	Exterior Levee (355 + 00)	60	180
Trench 8	Pump Station #1 (353 + 81)	360	360

Table 1. Continued. Depth of PSA Identified at Soil Testing (ST) Locations,
Backhoe Trenches and Bank Exposures, Swan Lake HREP.

Designation	Project Location	Depth of Construction Impact (cm)	Depth of PSA Deposit (cm)
Trench 9	Pump Station #1 Swan Lake Channel	360	70
Bank Exposure 1	Outside Project Area (317 + 00)	-	65
ST-22	Exterior Levee (290 + 75)	60	100
ST-23	Pump Station #2 (287 + 00)	360	120
ST-24	Pump Station #2 Illinois River Channel	360	140
ST-25	Exterior Levee (251 + 00)	60	130
ST-26	Exterior Levee (218 + 00)	60	240
ST-27	East of Exterior Levee (177 + 00)	-	180
ST-28	East of Exterior Levee (117 + 00)	-	160
ST-29	Exterior Levee (52 + 00)	60	70
ST-30	Pump Station #3 Swan Lake Shoreline	360	10
ST-31	Pump Station #3 Terrace Escarpment	360	-

Table 1. Continued. Depth of PSA Identified at Soil Testing (ST) Locations, Backhoe Trenches and Bank Exposures, Swan Lake HREP.

Project Designation	Location	Depth of Construction Impact (cm)	Depth of PSA Deposit (cm)
ST-32	Pump Station #3 Terrace	360	-
Trench 10	Borrow Area E	150	0
ST-33	Southern Boat Ramp	60	160
ST-34	Northern Boat Ramp	60	100

B horizons observed at these locations provide evidence that these landscapes are of considerable Holocene age. At Pump Station #3, one profile (ST-32) has a surface A horizon to a depth of about 25 cm, followed by a well-developed, argillic B horizon. At the base of the soil profile observed at ST-31 there appears to be red and grey silt laminae in the parent material matrix. Field conditions (raining) made it difficult to more definitively identify the silts, but if these actually occur they date to around 9500 to 9700 BP.

It appears that the early Holocene terrace at Pump Station #3 has experienced some recent erosion. The lower portion of the terrace, near the Swan Lake shoreline, clearly has experienced significant historical erosion, and it appears that upslope, away from the shoreline, some erosion also has occurred. The distribution and magnitude of late Holocene and historical erosion, however, can not be determined at this time.

Trench 10 (Borrow Area E) was excavated on an early to mid Holocene terrace that is capped by a late Holocene soil (Figure 9). PSA deposits are not significant at this location. The trench profile shows poorly-drained soil conditions, and the contact between the upper and lower deposits is marked by a buried soil beginning at a depth of about 80 cm.

ST6 was advanced at the extreme northwestern end of the project area. The profile observed here shows a fine-grained, poorly-drained deposit with argillans in the B horizon and secondary carbonates below. The landscape position and relative degree of soil development indicate an older Holocene age, probably around mid Holocene.

The Late Holocene to Historic Surface

The remaining cores and trenches were advanced and excavated on late Holocene to historic aged surfaces. The long, narrow, generally north-south oriented linear ridge (lateral accretion and /or natural levee) is a late to very late Holocene deposit with some areas containing extremely thick PSA (Figures 7, 8, and 9). A geomorphological study conducted by the BLM for the Corps in 1994 found that between 36 and 70 inches of sediment was deposited over boundary monuments in the project area since 1935-1940. Generally, these areas contain a variable cap of PSA which in turn overlies late Holocene soils showing somewhat poorly to poorly-drained conditions. A few of the late Holocene soils show somewhat poorly to moderately well-drained conditions.

Several cores and trenches were placed along the northern portion of the project area. Borrow areas A-D are located on the late Holocene surface (Figure 7). Buried pre-settlement soils were identified throughout the northern portion of the construction area, including the borrow areas. The late Holocene, pre-settlement soils generally are somewhat poorly to poorly drained and are capped by more than 50 cm of PSA.

A second buried soil was identified in the profiles of some of the trenches and cores. The somewhat older, late Holocene soil was recognized at ST-17 and Trench 6 (Figure 7). The pre-settlement soil below 80 cm of PSA (Trench 6) was radiocarbon dated at 860 +/- 60 years BP (Beta 77130), and, at a depth of about 200 cm, the second, older, late Holocene buried soil was dated at 1480 +/- 70 years BP (Beta 77131). Based on this evidence, it appears that the linear ridge traversed by the proposed exterior levee lies on a relatively young late Holocene surface that contains buried soils.

Generally, continuing south along the proposed exterior levee, the PSA gradually thickens and the ridge deposits appear to become younger. For example, a historic radiocarbon date (20 +/- 70 years BP) was obtained from Trench 8 (Figure 7) at a depth of 360 cm (Beta 77132), and the occurrence of somewhat poorly to moderately well-drained, late Holocene soils declines farther south along the proposed exterior levee. This condition is especially true south of Bank Exposure 1, where a moderately well-drained, late Holocene soil was identified (Figure 7). Only one other profile showed a buried soil that was not poorly or very-poorly drained. A deep core at Pump Station #2 (ST-24) shows 140 cm of PSA, underlain by a somewhat poorly-drained, late Holocene soil that has the potential for containing cultural materials (Figure 8).

A second deep core (ST-23) was advanced to a depth of 390 cm at Pump Station #2. ST-23 shows PSA to a depth of 120 cm and, below this depth, a very late Holocene to historic age wetland soil (Figure 8). The remaining cores advanced south of this pump station (ST-24 - ST-29) show thick PSA over very poorly-drained, very late Holocene to historic aged soils (Figures 8 and 9). Similarly, both the northern and southern boat ramps (ST-33 and ST-34) show poorly-drained, late to very late Holocene soils below thick deposits of PSA (Figures 8 and 9).

Conclusion

Most of the construction corridor at Swan Lake lies on somewhat poorly drained, young, late Holocene to historic floodplain surfaces and most areas have a very low potential for containing archaeological deposits within the shallow impact construction zone. Generally, a variable cap of post-settlement alluvium (PSA) exists along most of the construction corridor. Where the PSA cap exists, it tends to average between 50 cm to around 180 cm, although a few areas had even thicker PSA. Where the impact zone is deeper, particularly at the borrow areas and pump stations, the potential exists for penetration through the PSA and into buried pre-settlement soils.

Soil coring and backhoe trenching documented 0-10 cm of PSA at 4 locations within the project area, 50-100 cm of PSA at 24 locations, and 120-360 cm of PSA at 17 locations (Table 1). The depths of the PSA deposit recorded in Trench 8 (360 cm) and Trench 10 (0 cm) suggest that the depth of historical alluvium varies with distance from the Illinois River and, perhaps, Swan Lake (Table 1; Figures 5,7 and 9). Within this range, however, a large part of the variation in the depth of PSA across the project area appears to be accounted for by relatively minor differences in elevation, and by differences in the orientation of the Illinois River in relation to the landforms traversed by the project corridor.

The depth of the PSA deposit was found to exceed the maximum depth of construction impact within most of the project area. These areas include: all but the extreme northern end (ST-6) of the construction corridor of the exterior levee; Borrow Area A; the Pump Station #1 and #2 construction areas; and, the construction areas of both the northern and the southern boat ramps and associated parking lots (Table 1). Construction in these areas will not impact soils having the potential to contain cultural resources.

Conversely, the maximum depth of construction impact extends below the PSA deposit within the following areas: Borrow Areas B, C, D, and E; the western channel of Pump Station #1; the eastern channel of Pump Station #2; Pump Station #3 and associated channels; and, the Pump Station #3 access road. One or more early to late Holocene soil surfaces were identified in the construction impact zone in each of these areas. Some of these native soils were characterized as being somewhat poorly-drained to moderately well-drained, and, therefore, as having some potential for containing cultural resources. Consequently, the archaeological survey conducted following completion of the geomorphological investigation focused on the areas containing these soils.

The results of the geomorphological investigation indicate that at least some potential exists for buried cultural materials along the northern portion of the project corridor. Most of the buried soils are somewhat poorly to poorly drained, with a few being moderately well drained. The radiocarbon dates obtained for two buried soil surfaces in this portion of the project area indicate that the age of the linear lateral accretion ridge/levee paralleling the Illinois River is relatively young, and of late Holocene age.

Areas south of Bank Exposure 1 (river mile 10.3) generally contain thicker PSA and younger, more poorly drained soils. Moreover, soil core locations along the western portion of the linear ridge tend to have very thick PSA overlying very late Holocene to historic-aged wetland soils, indicating that considerable sedimentation has occurred in the Swan Lake paleochannel. These findings are consistent with late nineteenth-century observations concerning the rapid filling of swampy portions of the Illinois River floodplain as a result of siltation caused by annual flooding (Worthen 1868:105), as well as with a 1964 geomorphological study conducted by the BLM that found that between 36 and 70 inches of sediment had been deposited over boundary monuments in the project area since 1935-1940. The thick PSA deposits occurring at the north and south boat ramps, 160 cm and 100 cm respectively, also suggest that thick historical sedimentation has occurred in Swan Lake.

The Persimmon site (Pump Station #3) and Borrow area E do not contain significant PSA except near the Swan Lake shoreline at the Persimmon site. This portion of the project area lies on an early and early to mid Holocene terrace. It appears that the early Holocene terrace occupied by the Persimmon site has experienced some recent, and possibly some late Holocene, erosion. However, the complex nature of this surface needs additional investigation to better define the chronology of Holocene geomorphic events.

Earlier work conducted by Hajic (1987) developed landscape assemblages of various archaeological potential nearby in the Illinois River system. At Stump Lake, Illinois River Pool 26, natural levee deposits were found to contain buried surfaces of late Holocene age, although no buried archaeological sites were found on these buried surfaces (Titus et al. 1995). The Illinois River deposits across from Stump Lake in the Swan Lake project area contain deposits from early Holocene through to the historic period.

In contrast, the Persimmon site lies on an early Holocene surface which has experienced a complex post depositional history, and Borrow Area E, which contains no significant PSA, has a late Holocene soil profile over an older early to mid Holocene deposit. Finally, the extreme northwestern corner of the project area contains deposits expected to be of early to mid Holocene age.

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CHAPTER VI. RESULTS OF ARCHAEOLOGICAL SURVEY

Introduction

Two archaeological sites were investigated during the present survey, including one prehistoric site (11-C-152) and one site containing both prehistoric and historic components (11-C-212). This chapter presents a description of both of these sites and an inventory of the artifacts recovered from them.

A modified version of the functional artifact typology used by American Resources Group, Ltd., for previous survey and testing projects (Moffat et al. 1989; Titus and Snyder 1992; Titus et al. 1993) has been used to organize the data presented in the prehistoric artifact inventory table. This functional typological system is similar to that used by McMillan (1971) and Ahler and McMillan (1976) to analyze the artifacts from Rogers Shelter. Originally developed by Winters (1969), this typological system facilitates inference of site function by grouping artifact classes into general behavioral categories.

Site Descriptions

11-C-152

Site Type: Prehistoric habitation, base camp

Components: Early Woodland, Middle Woodland, and Late Woodland

Site Location: SW1/4, SW1/4, SE1/4; NW1/4, SW1/4, SE1/4; and NE1/4, SW1/4, SE1/4 of Section 3; and NW1/4, NW1/4, NE1/4; NE1/4, NE1/4, NW1/4; and NW1/4, NE1/4, NW1/4 of Section 10, T13S-R1W

Project Location: Pump Station #3 construction area; Project Stations 19+00-21+00

Approximate Site Area: Total site area > 58,000 m²; area inside project area = 13,500 m²

Topographic Location: Terrace

Elevation: 420-428 ft AMSL

Soil Series: Beaucoup silty clay loam

Nearest Water: Swan Lake slough (lake) immediately west; Illinois River, 100 m north

Site Condition: The site has sustained a moderate to severe degree of erosion.

Description. Site 11-C-152, the Persimmon site, was first recorded in 1975 during an Illinois River shoreline survey conducted by the Northwestern University Contract Archaeology

Program, Kampsville Illinois, for the St. Louis District, U.S. Army Corps of Engineers (Farnsworth 1976). The site is a large, moderately dense to dense scatter of prehistoric artifacts situated on a terrace overlooking the Illinois River and Swan Lake (Figure 10). A small portion of the southern end of the site is located within the proposed construction area of Pump Station #3 and its associated channels, but most of the site lies outside the project area to the north.

The Phase I investigation at the Persimmon site included a surface survey of the Swan Lake and Illinois River shorelines, and shovel testing of the terrace and its western escarpment inside the project area. A preliminary geomorphological assessment of the Persimmon site was carried out at this time as well.

The shoreline survey was extended a considerable distance outside the project area in order to determine the northern and southwestern boundaries of the site, and to obtain a sample of the site contents. During the shoreline survey, a continuous scatter of prehistoric artifacts was observed along the full length of the narrow, sandy beach that bounds the Persimmon site on the north and west, but artifact density was highest along the portion of the shoreline located within the project area. The southwestern boundary of the site was subsequently extended approximately 260 m south of the site limit reported by Farnsworth (1976) in order to encompass the full extent of the artifact scatter observed during the present survey of the Swan Lake shoreline (Figure 10).

Screened (1/4") shovel tests were excavated on a 10 m grid within the proposed construction area of Pump Station #3 and its associated channels, and the construction corridor of the exterior levee and the pump station access road (Figure 11). A total of 130 shovel tests was dug in the site area, and 39 of these contained cultural material (Figure 12). The number of artifacts found in the shovel tests varied from a maximum of 11 to a minimum of 1. Artifact density within the project area is highest on the terrace and high on the upper slope of the escarpment. The shovel testing results indicate that the inland boundary of the portion of the Persimmon site contained within the project area is located approximately 20 m east of the terrace edge, in a wooded area bounding the western edge of a large agricultural field (Figure 12). The inland boundary of the northern end of the site, which is located on private property outside the project area, remains undetermined (Farnsworth 1976)(Figure 10).

No artifacts were recovered from the vast majority (79%) of the 42 shovel tests excavated within 20 m of the dense artifact concentration observed along the Swan Lake shoreline in the project area (Figure 12). This pattern suggests that a substantial portion of the terrace, and the site formerly occupying it, has been removed by erosion, the artifacts observed along the Swan Lake shoreline being deposited here in the process. The horizontal and vertical artifact-distribution patterns identified during shovel testing farther upslope on the terrace escarpment provide further evidence in support of this interpretation. Only one of the 25 positive shovel tests excavated on the terrace escarpment yielded more than three artifacts (Figure 12), and all of the artifacts recovered from these tests were found within a 25-cm-thick layer of black 10YR2/1 sandy silt that appears to represent flood-deposited sediments of post-occupational origin; typically, this surface deposit was underlain by brown 10YR5/3 clayey silt near the Swan Lake shoreline, and by dark

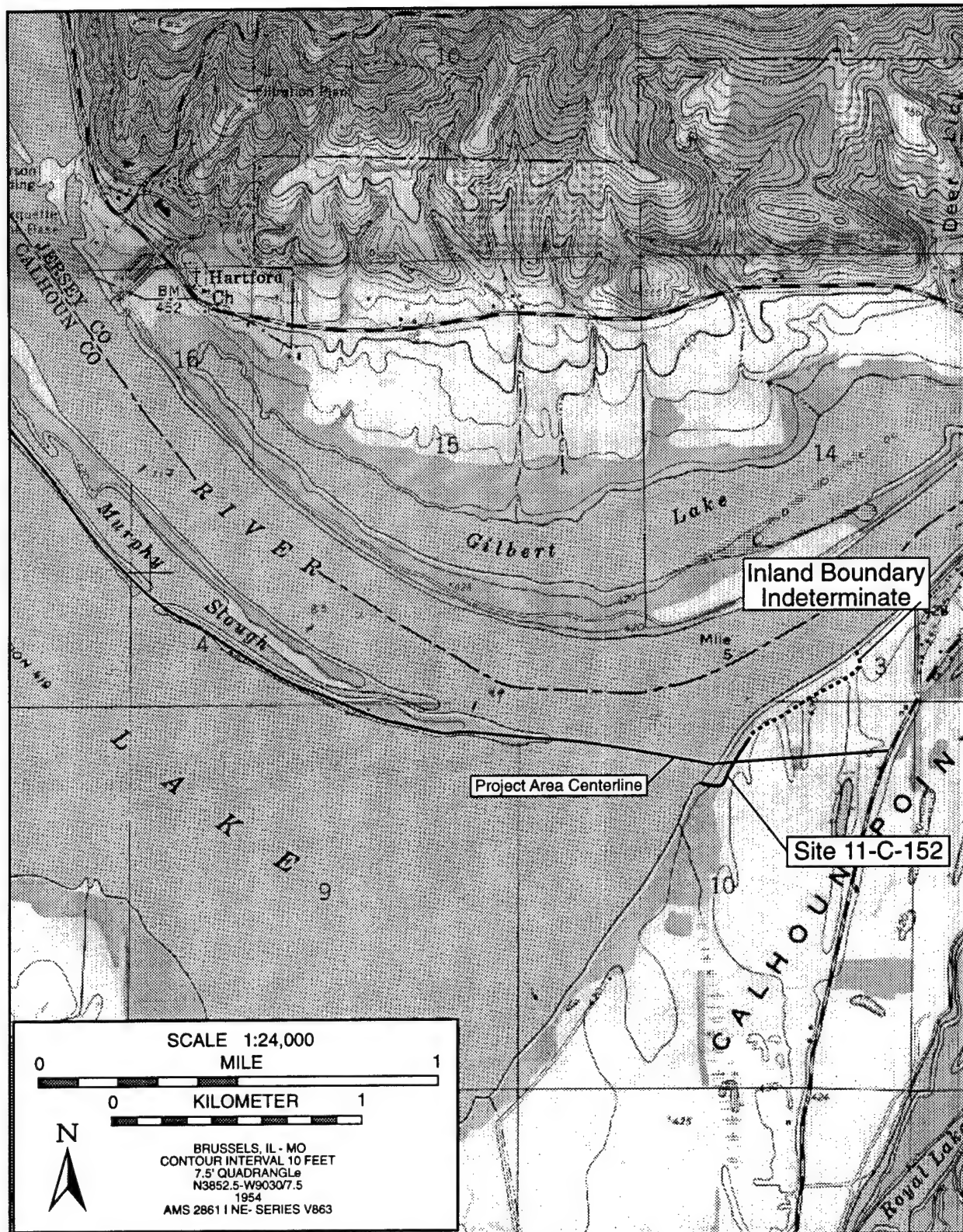


Figure 10. Topographic location of site 11-C-152, the Persimmon site, in relation to the Swan Lake HREP project area.

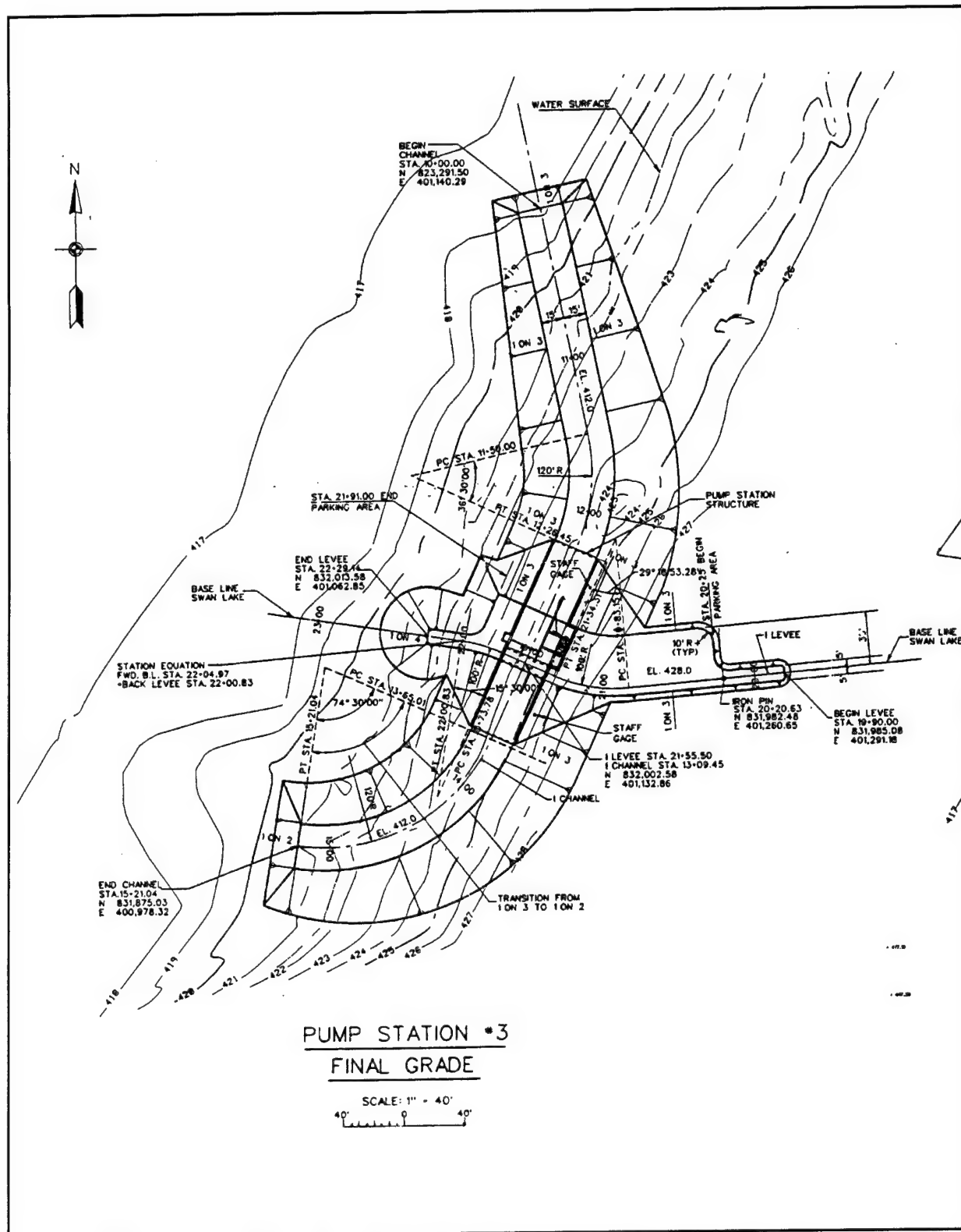


Figure 11. Construction plan of proposed pump station #3 and associated channels, exterior levee, and pump station access road, Swan Lake HREP.

Site 11-C-152

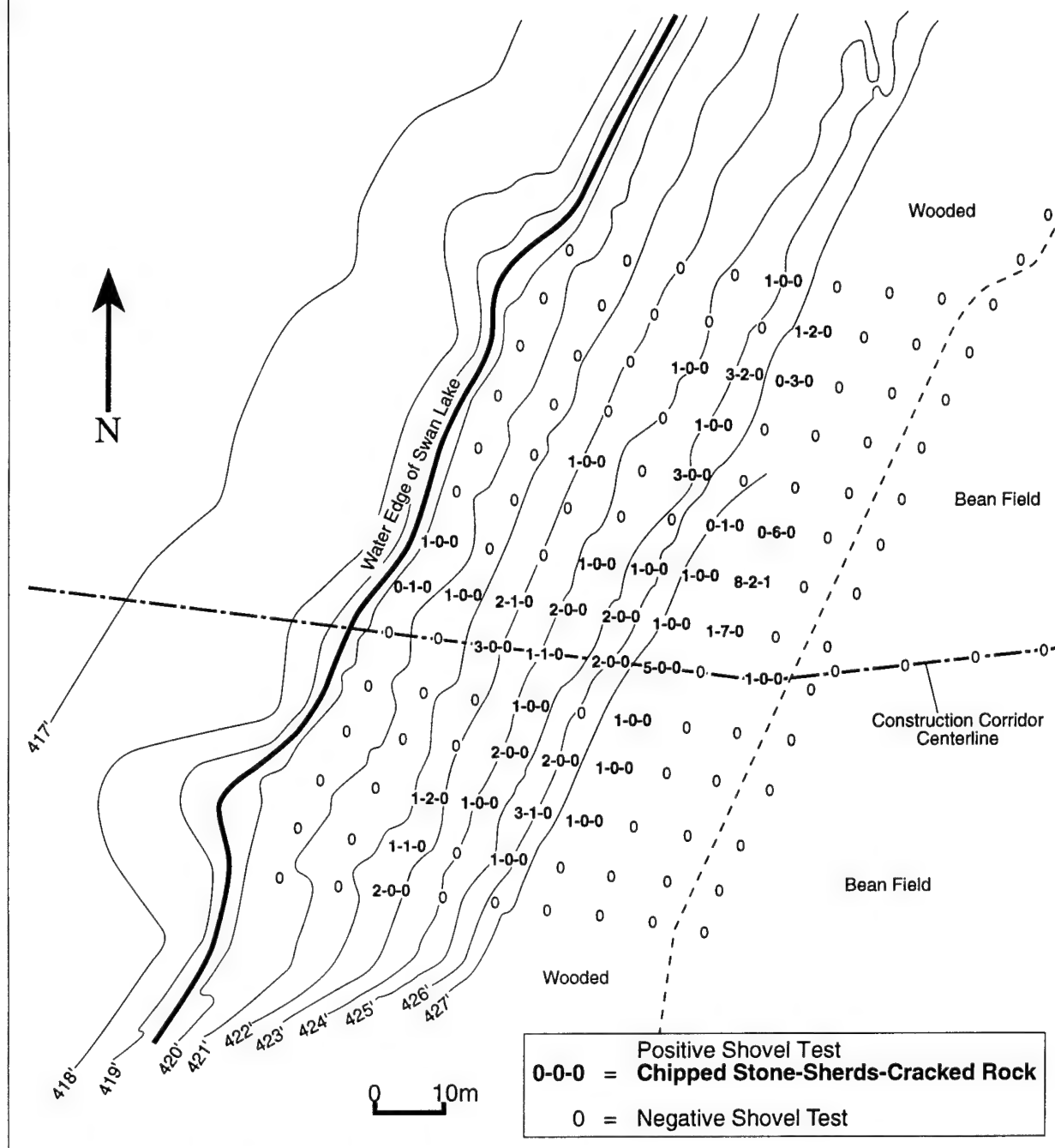


Figure 12. Site plan, 11-C-152, within the proposed construction area of Pump Station #3, Swan Lake HREP.

grayish brown 10YR4/2 silty sand farther upslope. By contrast, four of the 13 positive shovel tests excavated on the terrace yielded more than three artifacts, and two of these produced eight or more artifacts (Figure 12).

The two shovel tests yielding the largest number of artifacts were located approximately 10 m east of the terrace edge and 10-20 m north of the construction corridor centerline (Figure 12). These two tests exhibited similar soil profiles and vertical artifact-distribution patterns. Three soil strata were distinguished in the profile of each test: Stratum 1 is a culturally sterile, flood-deposited layer consisting of a loose, black 10YR2/1 sandy silt loam that extended to a depth of approximately 25 cm below surface (BS); Stratum 2, which was distinguished following a sharp, well-defined break in soil color, consists of a compact, very dark gray 10YR3/1 sandy silt that extended from a depth of approximately 25 cm BS to 52 cm BS; and, Stratum 3 is a culturally sterile subsoil consisting of a very compact, medium brown 10YR4/3 sandy, clayey silt mixed with very dark grayish brown 10YR3/1 silt that extended from a depth of approximately 52 cm BS to the base of the shovel tests (60-65 cm BS). All of the artifacts recovered in these two shovel tests, including eight Black Sand/Liverpool series sherds, were found in Stratum 2, suggesting this deposit represents an intact midden associated with Early Woodland occupations. This intact midden remnant may cover an area no larger than 200 m² within the project area.

The geomorphological investigation conducted at the Persimmon site consisted of soil coring. Three sampling tube cores were advanced and described at three locations along the construction corridor centerline, one on the terrace at the eastern edge of the site (ST-32), one approximately halfway down the terrace escarpment (ST-31), and one near the Swan Lake shoreline at the western edge of the site (ST-30). Soil profile development and basal late glacial red silts indicate the terrace dates to the early Holocene. The portion of the terrace located farthest from the Swan Lake shoreline appears relatively undisturbed, but late Holocene and historical erosion have affected the surfaces downslope. Soils observed in the core advanced nearest the shoreline suggest this portion of the site has sustained the most historical erosion.

Artifacts. A total of 256 artifacts was recovered at site 11-C-152, including 164 from the Swan Lake and Illinois River shorelines and 91 from shovel tests (Table 2). Approximately 75% of the artifacts in the shoreline collection were found inside the project area. The site collection includes 16 chipped-stone tools, 77 ceramic sherds, 3 amorphous cores (Figures 13a and 13c), 156 debitage flakes, 3 bone fragments, and 1 cracked rock. One of the three bone fragments, from a large mammal, was collected from the Swan Lake shoreline, and two are turtle carapace fragments found in a shovel test. A small amount of cracked rock was observed along the shoreline, but was not collected.

The tool assemblage from site 11-C-152 consists of 5 bifaces, 2 formal flake tools, and 9 informal flake tools (Table 2). The bifaces include 3 projectile point/hafted knives and 2 unspecified bifaces (Figure 13b) that are too fragmentary to permit more specific technological/functional identification. Both of the formal flake tools exhibit steep edge-retouch, suggesting they may have been used as scrapers.

Each of the three projectile points/hafted knives recovered at site 11-C-152 is temporally diagnostic. The temporally diagnostic points include one Early Woodland Waubesa (Mason) point and two Early Woodland Dickson Contracting Stemmed points. The Waubesa point was recovered from a shovel test excavated on the terrace edge, 50 m east and 10 m south of the northwestern corner of the shovel test grid (Figure 12). Both of the Dickson points were found on the Swan

Table 2. Prehistoric Artifact Inventory, Site 11-C-152, Swan Lake HREP.

Artifact Categories	General Surface	Shovel Tests	Total
Hunting & General Utility Tools			
Proj. Pts./Hafted Knives	2	1	3
Unspecified Bifaces		2	2
Informal Flake Tools	9		9
Formal Flake Tools	2		2
Total	13	3	16
Heating & Cooking Debris			
Cracked Rock			
<i>Igneous/Metamorphic</i>		1	1
Bone	1	2	3
Total	1	3	4
Domestic Equipment			
Pottery	50	27	77
Total	50	27	77
Stone Tool Production & Maintenance Debris			
Cores			
<i>Amorphous</i>	3		3
Debitage			
<i>Primary Decortication Flakes</i>	2	1	3
<i>Secondary Decortication Flakes</i>	3		3
<i>Tertiary Flakes</i>	10	4	14
<i>Biface-1 Flakes</i>	4	12	16
<i>Biface-2 Flakes</i>	9	6	15
<i>Broken Flakes</i>	59	27	86
<i>Angular Fragments</i>	11	8	19
Total	101	58	159
Overall Total	165	91	256

Lake shoreline, one approximately 20 m north, and the other approximately 40 m southwest, of the northwestern corner of the shovel test grid (Figure 12).

The Adena Stemmed/Waubesa (Mason) point is diagnostic of the Early Woodland period (Justice 1987:192). This point type is included within the Belknap type-cluster, which is

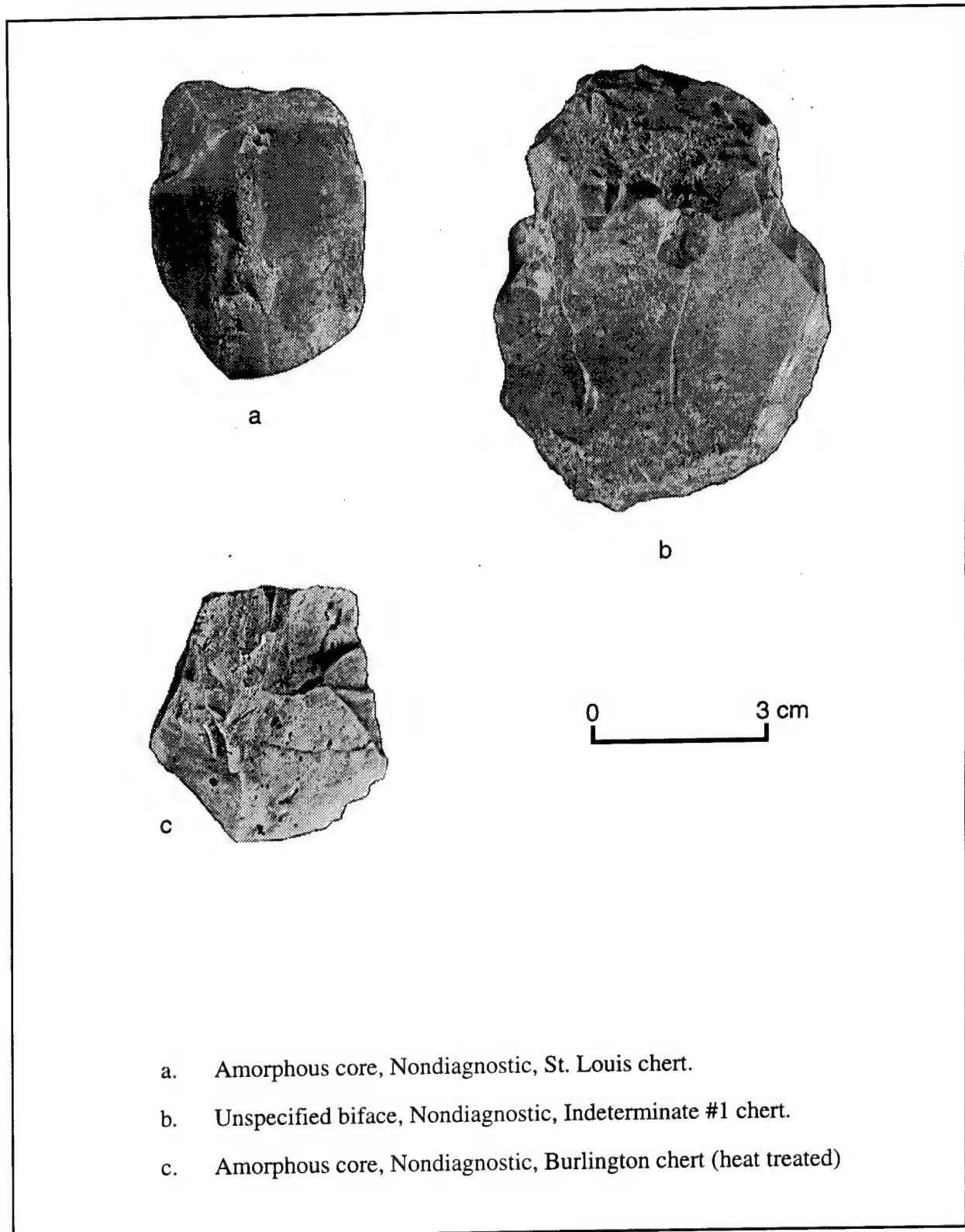


Figure 13. Selected chipped-stone artifacts, site 11-C-152.

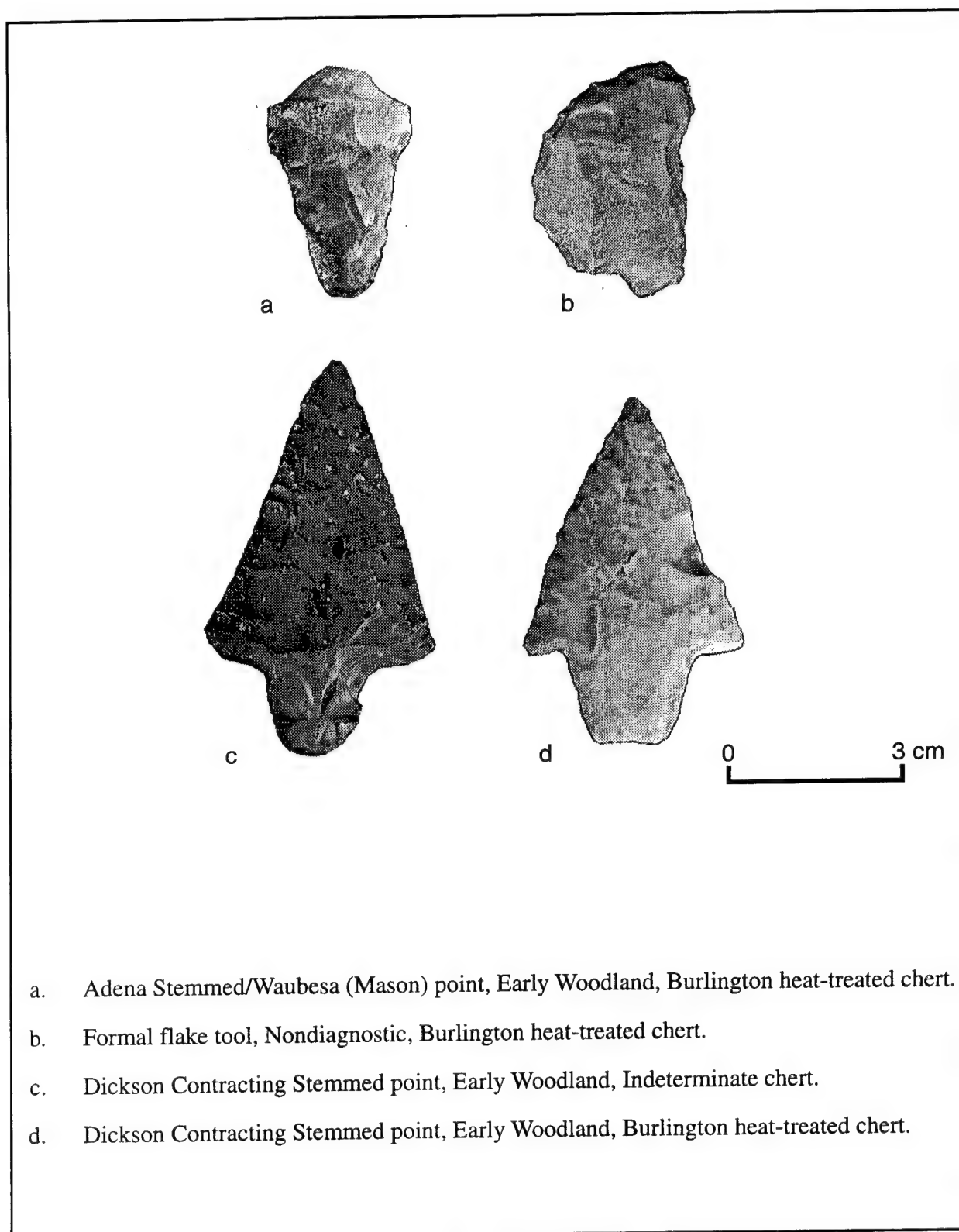
represented in the lower Illinois River valley (Farnsworth and Asch 1986:371). This form has also been referred to as "Beavertail" due to its characteristic ovate stem. Adena Stemmed/Waubesa (Mason) points have been associated with the Florence phase of the American Bottom, which dates from 500-300 B.C. This phase was recently identified at the Florence Street site located near East St. Louis, Illinois (Fortier, Emerson, and Finney 1984:59-103). Perino (1985:243), however, distinguishes the Mason point from points of the Adena cluster, indicating that the blade morphology of the true Mason point is quite different from that of the Adena point. In addition, the stem of the Mason point is usually heavily ground, as is the stem of the basal fragment recovered at site 11-C-152 (Figure 14a). Therefore, this specimen may in fact be an example of a true Mason point, which is diagnostic of the Late Archaic-Early Woodland period (Perino 1985:243).

The Dickson Contracting Stemmed point is diagnostic of the Early Woodland period (Justice 1987:190-191). The Peisker site, located in the lower Illinois River valley, produced Dickson Contracting Stemmed points in contexts dating from 500-300 B.C. The two specimens recovered from site 11-C-152 (Figure 14c and 14d) are actually very similar to the Dickson Broad Bladed point type, a variant which is included in the Belknap type-cluster (Farnsworth and Asch 1986:371).

Debitage is the most abundant artifact class represented in the site collection. Approximately 67% of thedebitage consists of broken flakes and angular fragments. The majority (61%) of the remainder of the flakes consist of biface thinning and resharpening flakes, but tertiary flakes are also well represented (Table 2).

The artifact collection from site 11-C-152 contains evidence of both biface and amorphous core technology. The composition of the tool and core assemblages, and the relative frequencies of thedebitage categories represented in the collection, suggest lithic reduction activities at the site emphasized late-stage biface manufacture, biface maintenance and repair, and simple flake tool manufacture.

Burlington chert dominates the site 11-C-152 lithic assemblage by count and weight, representing, respectively, approximately 80% and 71% of the chipped-stone artifacts from the site (Table 3). Approximately 62% of the chipped-stone artifacts identified as heat-treated Burlington chert exhibit the distinctive discoloration characteristic of sand ridge patination. St. Louis Common chert is the second most frequently occurring chert type identified in the site collection. This chert type accounts for a substantially larger proportion of the assemblage by weight (23%) than by count (13%), and represents a disproportionately large percentage of the amorphous cores (67%) and informal flake tools (33%) identified in the collection (Table 3). This pattern suggests that the prehistoric occupants of the Persimmon site may have been exploiting locally available St. Louis Common chert for the primary purpose of manufacturing simple flake tools.



- a. Adena Stemmed/Waubesa (Mason) point, Early Woodland, Burlington heat-treated chert.
- b. Formal flake tool, Nondiagnostic, Burlington heat-treated chert.
- c. Dickson Contracting Stemmed point, Early Woodland, Indeterminate chert.
- d. Dickson Contracting Stemmed point, Early Woodland, Burlington heat-treated chert.

Figure 14. Selected chipped-stone tools, site 11-C-152.

Table 3. Chert Type Identification by Tool and Debitage Categories, Site 11-C-152, Swan Lake HREP.

Artifact Categories	Chert Type									
	Burlington #	Wt. #	Burl. HT* #	Wt. #	St. Louis #	Wt. #	Indeterminate #	Wt. #	Total #	Wt. #
Hunting & General Utility Tools										
Proj. Pts./Hafted Knives			2	23.2			1	13.9	3	37.1
Unspecified Bifaces	1	1.5			1	14.8			2	16.3
Informal Flake Tools			6	137.5	3	25			9	162.5
Formal Flake Tools			2	86.4					2	86.4
Total	1	1.5	10	247.1	4	39.8	1	13.9	16	302.3
Frequency	6%	0.5%	63%	82%	25%	13%	6%	5%	100%	100%
Stone Tool Production & Maintenance Debris										
Cores										
<i>Amorphous</i>			1	30.4	2	85.1			3	115.5
Debitage										
<i>Primary Decortication Flakes</i>			2	53.7	1	14.2			3	67.9
<i>Secondary Decortication Flakes</i>			2	32.3	1	1.9			3	34.2
<i>Tertiary Flakes</i>	1	0.5	11	36.6	1	0.8	1	12.1	14	50.0
<i>Biface-1 Flakes</i>			13	15.4	2	5.8	1	0.7	16	21.9
<i>Biface-2 Flakes</i>	1	1.1	14	8.7					15	9.8
<i>Broken Flakes</i>	7	23	65	61	8	6.6	6	7.5	86	98.1
<i>Angular Fragments</i>			11	78.6	4	33	4	17	19	128.6
Total	9	24.6	119	316.7	19	147.4	12	37.3	159	526.0
Frequency	6%	5%	75%	60%	12%	28%	8%	7%	100%	100%
Overall Total	10	26.1	129	563.8	23	187.2	13	51.2	175	828.3
Overall Frequency	6%	3.2%	74%	68.1%	13%	22.6%	7%	6.2%	100%	100%

HT* = Heat Treated, # = Count, Wt. = Weight

A total of 77 prehistoric ceramic sherds was recovered at site 11-C-152 during the present investigation, including 50 from the Swan Lake and Illinois River shorelines and 27 from shovel tests excavated in the Pump Station #3 construction area (Table 2). Thirty of the 50 sherds in the shoreline collection were found inside the project area, and the remainder were found along the shoreline to the north and south of the project area. All of the sherds greater than 1.5 cm in length were examined for surface treatment, decoration, and paste-temper. The discussion below is limited to these specimens.

Seventeen sherds are assignable to the Early Woodland period. All of these sherds were recovered in shovel tests excavated on the terrace and terrace escarpment. Eleven are examples of the Black Sand/Liverpool ceramic series (Farnsworth and Asch 1986; Fortier, Emerson, and Finney 1984). These sherds are characterized by a silty to sandy paste, fine to medium crushed grit temper, brown color, incised external surface treatment with smoothed interior, and range from 4 to 7 mm thick (Figure 15a-k). One of these is a rim sherd with incised crosshatching (Figure 15e). The remaining 6 sherds are examples of Cypress phase ceramics (Kenneth B. Farnsworth, personal communication, Nov. 19, 1994). These sherds are similar in composition and thickness to the Black Sand/Liverpool sherds described above, with the exception of their having plain or smoothed-over cordmarked exteriors (Figure 16a-f).

Twenty two sherds are assignable to the Late Woodland period. All but two of these sherds were found on the Swan Lake and Illinois River shorelines. Sixteen of the Late Woodland sherds are examples of the Bluff phase ceramic series, including 11 sherds tentatively identified as Early Bluff (A.D. 600-800) ceramics (Figure 17a-k) and 5 that are classified as Late Bluff (A.D. 800-1000) ceramics (Figure 18a-e)(Kenneth B. Farnsworth, personal communication, Nov. 19, 1994). All of these sherds are characterized by sandy paste, fine to medium crushed grit temper with some grog inclusions, a brown to orange color with some grading to light gray, and cordmarked or smoothed-over cordmarked exterior surfaces with smoothed interiors. Thickness ranges from 3 to 5 mm. The six remaining Late Woodland sherds, including two found in a shovel test excavated on the terrace, are similar in composition, decoration, and thickness to Bluff phase ceramics, but could not be positively identified as such. Five of the 20 Late Woodland sherds found on the shoreline at site 11-C-152, including 3 Early Bluff sherds, 1 Late Bluff sherd, and 1 Late Woodland Type Indeterminate sherd, were found inside the project area, and the remainder were found outside the project area.

Fourteen sherds identifiable as Woodland sherds could not be assigned to a specific subperiod. Two of these sherds were found in shovel tests excavated on the terrace and terrace escarpment, seven were found on the shoreline inside the project area, and five were found on the shoreline outside the project area. These sherds are characterized by a silty to sandy paste, fine to medium crushed grit temper with some grog inclusions, a brown to light-brown to grayish-brown color, and cordmarked or smoothed-over cordmarked external surfaces with smoothed interiors. Thickness ranges from 3 to 6 mm. Also, one sherd appears to have an incised exterior and one is a plain surfaced rim sherd.

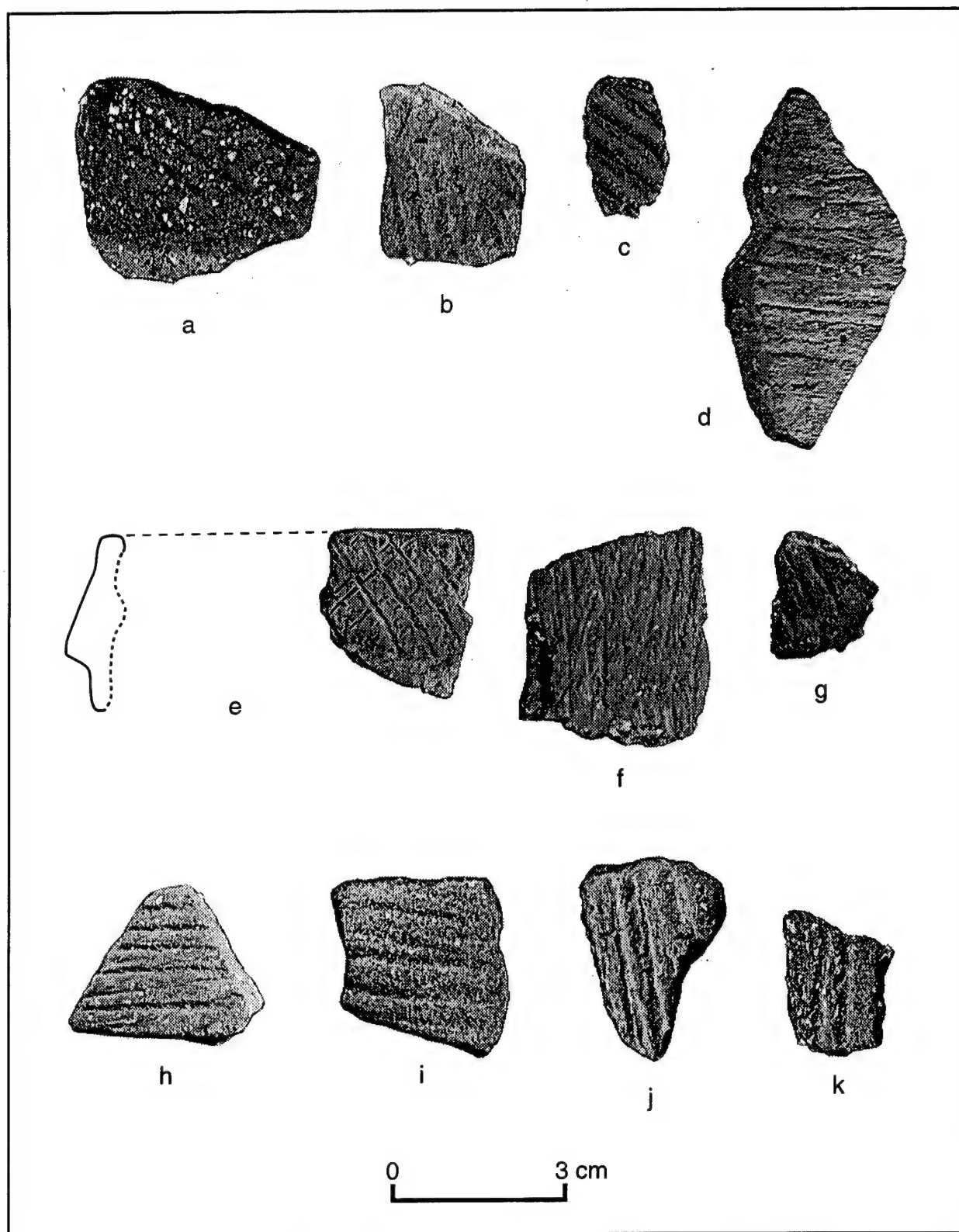


Figure 15. Early Woodland Black Sand/Liverpool series sherds, site 11-C-152.

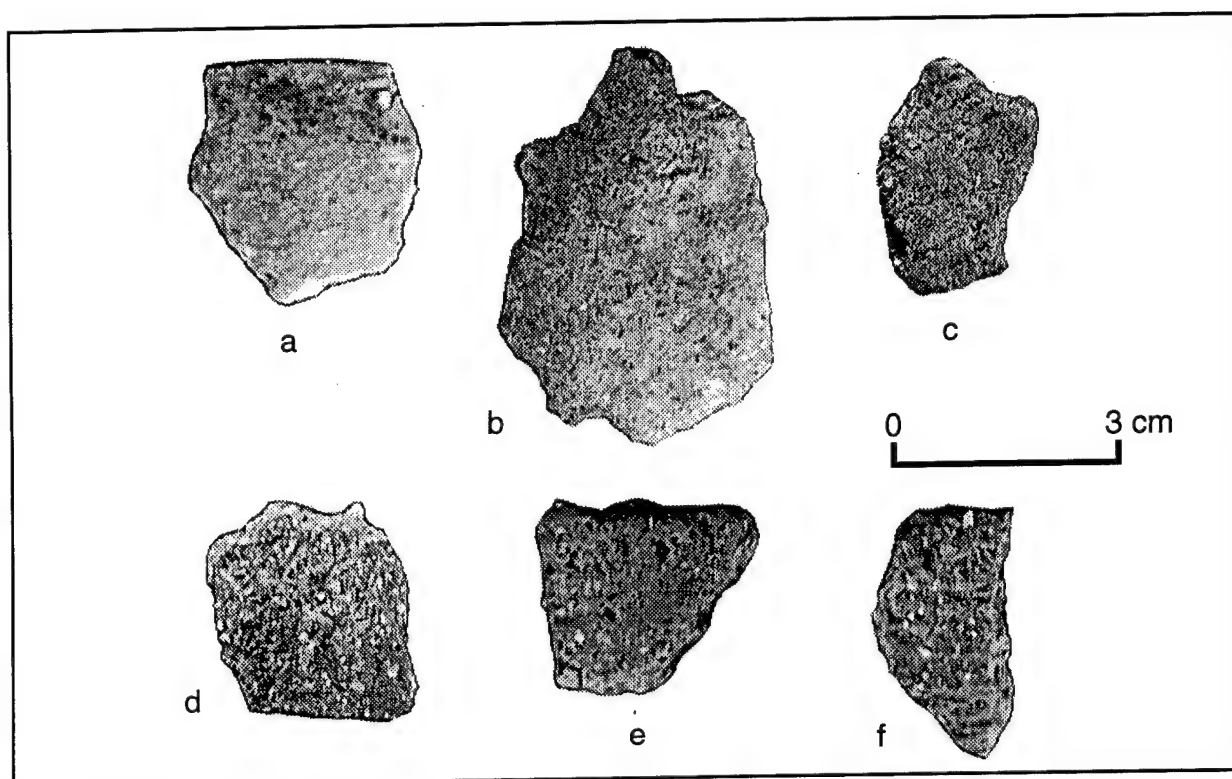


Figure 16. Early Woodland Black Sand/Liverpool series, Cypress Phase sherds, site 11-C-152.

The remaining 24 sherds are severely eroded, or extremely small, making cultural identification difficult. These sherds are characterized by a silty to sandy paste, fine to medium crushed grit temper with some grog inclusions, a brown to light-brown color, and thickness ranges from 3 to 6 mm. Due to their eroded nature, surface treatment is difficult to discern. Six of the eroded sherds were recovered in shovel tests excavated on the terrace escarpment, and the remainder were found on the shoreline inside the project area.

The site assemblage suggests that hunting and butchering, hide processing, lithic reduction, and heating and/or cooking are activities that occurred at or near site 11-C-152.

Interpretation. Site size is large, and artifact density and diversity are high, suggesting that site 11-C-152 may have functioned as a base camp during some part of its occupational history. The portion of the site located inside the project area appears to contain an intact midden remnant associated with Early Woodland, and possibly Late Woodland occupations, and may contain features associated with these components as well. The temporally diagnostic artifacts recovered from the intact cultural deposit consist predominately of Early Woodland Black Sand culture ceramics, indicating that the major occupation within the investigated portion of the site dates to this period. A shovel test excavated on the terrace, immediately north of the tests in which the

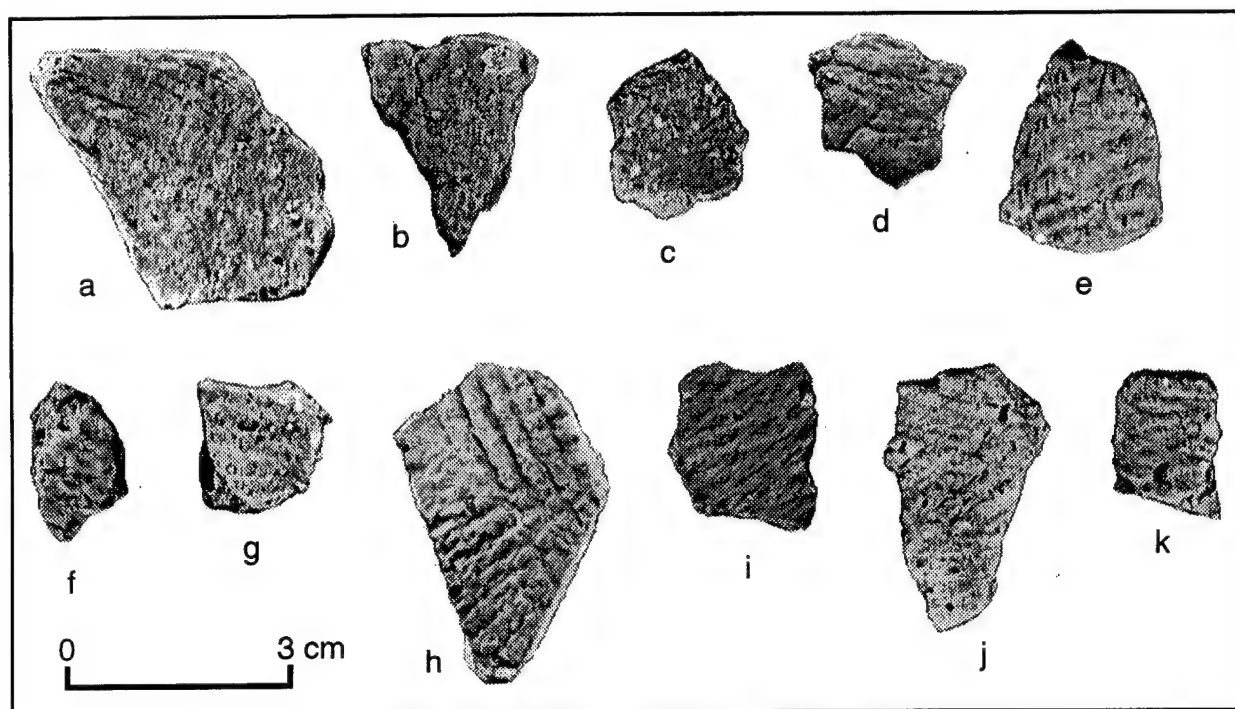


Figure 17. Late Woodland Early Bluff series sherds, site 11-C-152.

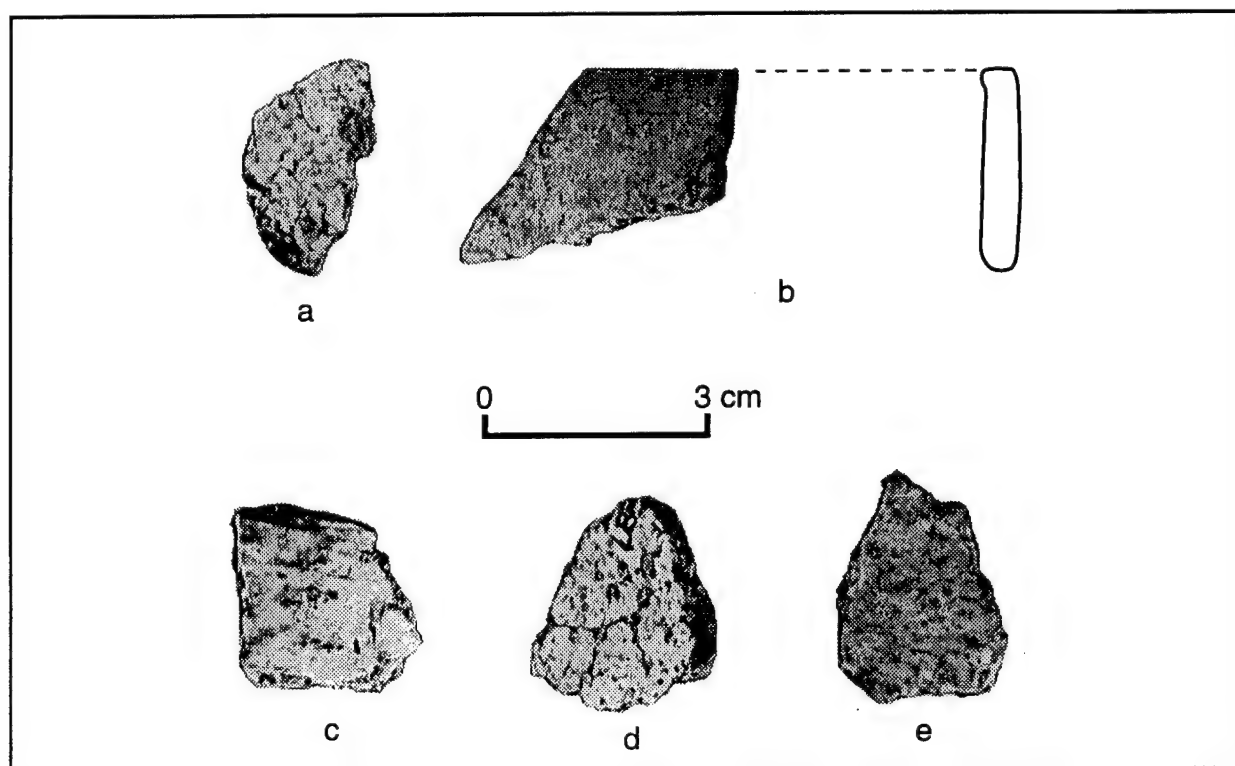


Figure 18. Late Woodland Late Bluff series sherds, site 11-C-152.

intact cultural deposit was identified, yielded two Late Woodland Type Indeterminate sherds, suggesting that this component, though possibly associated with the intact midden remnant, nonetheless represents a minor occupation at the site. The results of the present investigation also indicate that the intact cultural deposit present within the threatened portion of the Persimmon site are restricted to a relatively small area.

No evidence of the Middle Woodland component identified at the Persimmon site during the initial site survey (Farnsworth 1976) was recovered in the course of the present survey.

Site 11-C-212

Site Type: Prehistoric habitation; Historic farmstead

Components: Early Woodland; Late nineteenth century

Site Location: SW1/4, SE1/4, NW1/4, NW1/4; SE1/4, SW1/4, NW1/4, NW1/4; NE1/4, NW1/4, SW1/4, NW1/4 of Section 18, T12S-R1W

Project Location: Borrow Area D; Project Stations 376+00-380+00

Approximate Site Area: 13,977 m²

Topographic Location: Natural levee

Elevation: 425 ft AMSL

Soil Series: Beaucoup silty clay loam

Nearest Water: Illinois River, 250 m east

Site Condition: The historic component appears to have sustained a moderate degree of disturbance.

Description. Site 11-C-212 is a buried, dual-component site situated on a natural levee on the right (west) bank of the Illinois River (Figure 19). The site was identified in seven of the 30 deep-testing trenches excavated in proposed Borrow Area D (Figure 20). The abandoned agricultural field encompassed by the proposed borrow area is covered by a dense stand of 10-15 year old maples, and is surrounded on all sides by mature forest. The two-track dirt road bounding the borrow area on the east, which is the only road giving access to the site, leads north along the peninsula between Fuller Lake and the Illinois River and intersects a gravel road approximately .7 mile north of the site.

During the geomorphological investigation of Borrow Area D, one or more buried soil surfaces were identified in the profiles of Trench 7 and the cores advanced at ST-19 and ST-20 (Figure 20; Appendix B). The pre-settlement soil (A_b) was identified below 60 cm of PSA in the profile of ST-20, below 70 cm of PSA in the profile of Trench 7, and below 120 cm of PSA in the profile of ST-19 (Figure 20). It appears that the PSA deposit identified in the profile of ST-19 is much thicker than it is at the ST-20 and Trench 7 locations as a result of spoil from the drainage ditch lying immediately north of ST-19 covering the modern ground surface in this area (Figure 20). A second buried soil (AB_b) was identified in the profile of Trench 7, at a depth of 135-165 cm below surface, but this buried surface was not identified in the profiles of ST-19 or ST-20.

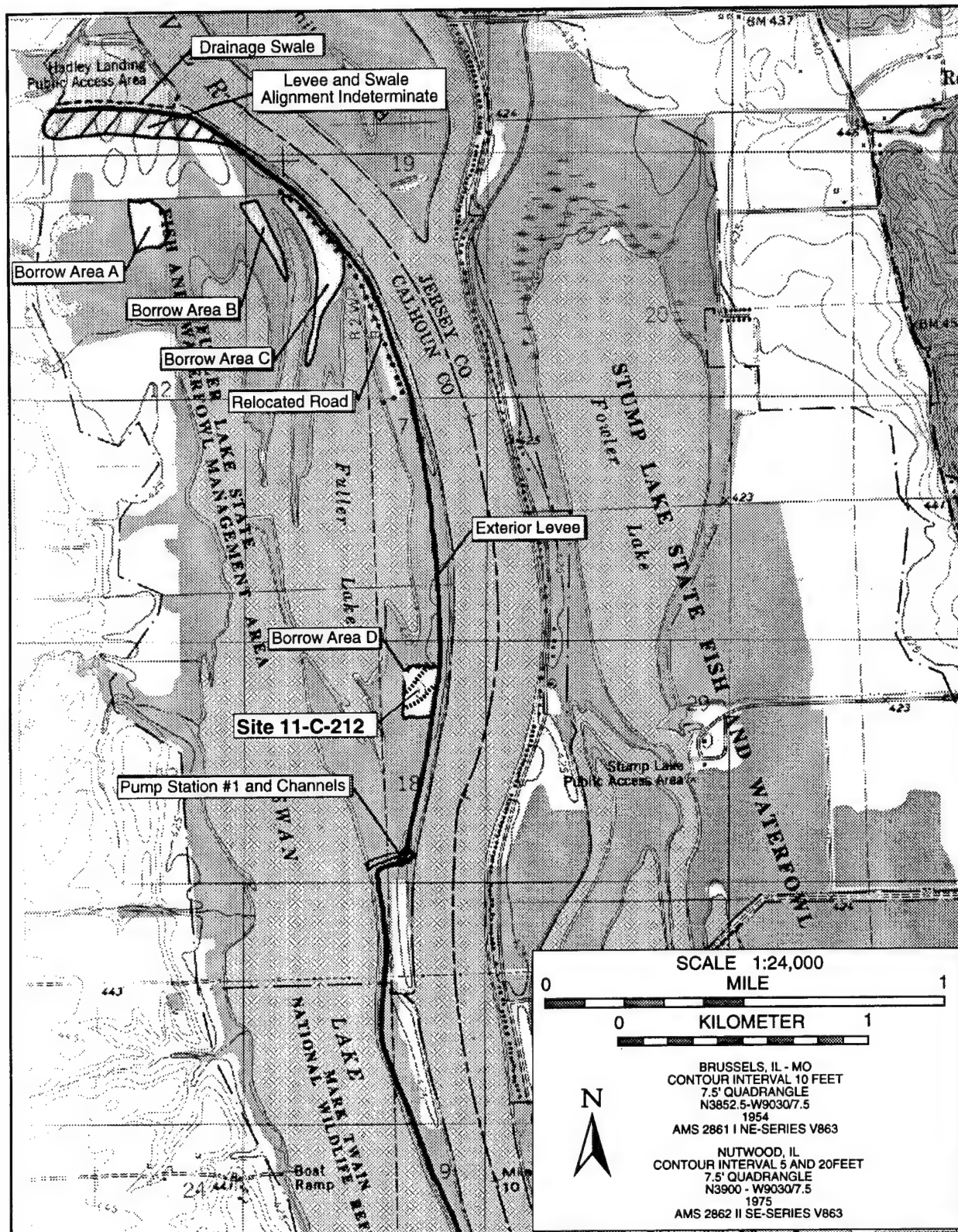


Figure 19. Topographic location of site 11-C-212 in relation to the Swan Lake HREP project area.

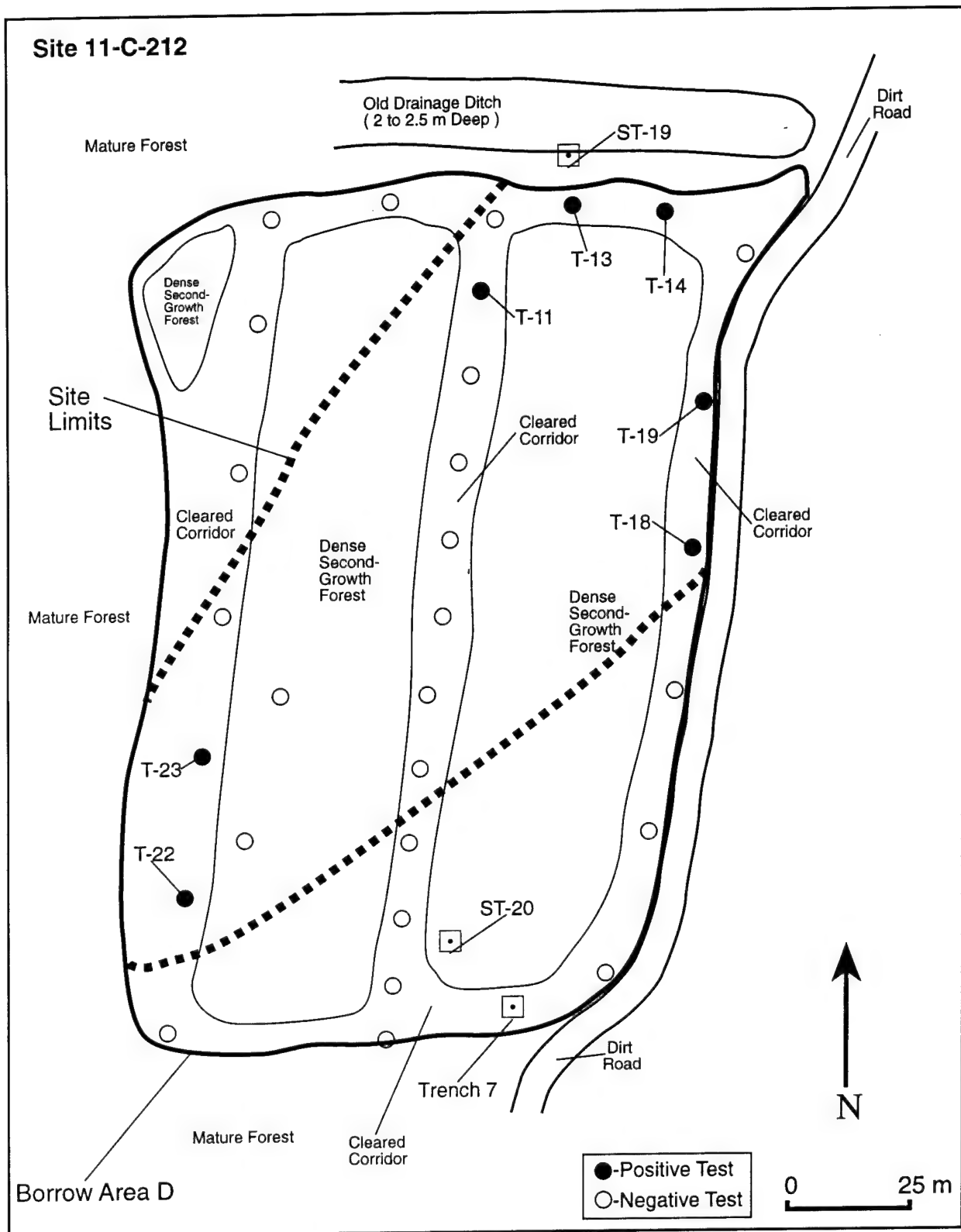


Figure 20. Site plan, 11-C-212, within Borrow Area D, Swan Lake HREP.

Both of the buried soils identified in Borrow Area D appeared to be somewhat poorly to moderately well drained, and, as a consequence, were evaluated as having some potential for containing cultural material. Both of these buried soils also lie within the construction impact zone, which extends to a maximum depth of 150 cm in each of the borrow areas. Consequently, these buried surfaces were investigated through screening a 25 cm² column of soil from a depth of 60 cm BS to a depth of 150 cm BS in each of the thirty deep testing trenches excavated in Borrow Area D. The historic component at site 11-C-152 appears to be associated with the uppermost buried surface identified in the borrow area, and the prehistoric component appears to be associated with the older, more deeply buried soil.

The historic component at site 11-C-212 consists of a light to moderately dense scatter of late nineteenth-century artifacts buried beneath approximately 60 cm of PSA. Historic artifacts were recovered from the screened soil columns and/or the trench walls in all but one (T-13) of the seven deep-testing trenches yielding artifacts (Figure 20). Four of the deep-testing trenches in which historic artifacts were identified (T-11, T-14, T-18, and T-19) are clustered in the northeastern corner of the borrow area; most of the historic artifacts found at site 11-C-212, including the vast majority of architectural-related materials (limestone, brick, mortar, nails), were identified in these four trenches, suggesting that a structure may have been located in this portion of the site. One artifact was found in each of the two trenches excavated in the southwestern corner of the borrow area, including a piece of aqua glass in T-22 (90 cm BS) and a small brick fragment in T-23 (80 cm BS)(Figure 20), suggesting that this portion of the site may represent a disposal/discard area associated with the structure presumed to have been located 125 m to the northeast.

All of the historic material identified at site 11-C-212 occurred at depths of 60-140 cm BS, and all but two of the identified artifacts were found at depths of 60-100 cm BS. A larger number of historic artifacts was identified in deep-testing trench T-14 than in any of the other trenches excavated at the site, including numerous small to medium-size pieces of limestone in each of the four walls of the trench (60-80 cm BS), and, also in the trench walls, one piece of burned clay, one piece of mortar, and one machine-cut nail fragment (70-80 cm BS). A soil column placed between the two largest pieces of limestone observed in the walls of T-14 yielded one piece of burned clay and one piece of mortar (60-70 cm BS), and one unidentified animal-bone fragment (70-80 cm BS). The single artifact recovered in deep-testing trench T-11, a fist-size piece of limestone found during soil-column excavation, occurred at a depth of 92 cm BS. The artifacts recovered in T-18 include a small brick fragment and an undecorated whiteware sherd (trench wall, 90 cm BS), a small amount of gravel (trench wall, 100 cm BS), and a melted piece of brown glass (trench wall, 140 cm BS). Three artifacts were identified in the walls of T-19, including an unidentified metal fragment (80 cm BS), a machine-cut spike (100 cm BS), and a machine-cut nail fragment (115 cm BS).

The prehistoric component at site 11-C-212 was identified in deep-testing trench T-13 (Figure 20). Two prehistoric artifacts were recovered in T-13, including a ceramic sherd from a

soil column (115-125 cm BS) and an angular fragment of chert from the first 10 cm level of a 50 cm x 50 cm test unit (125 cm BS).

Artifacts. A total of 15 historic artifacts was recovered at site 11-C-212, including 1 undecorated whiteware sherd, 1 melted, brown glass fragment, 1 aqua glass fragment, 4 machine-cut nails, 1 machine-cut spike, 1 unidentified metal fragment, 1 brick fragment, 3 pieces of mortar, 1 large limestone, 1 unidentified animal-bone fragment, and 2 pieces of burned clay. Numerous small to medium-size fragments of limestone were observed in deep-testing trench T-14, but none of these were collected.

Two prehistoric artifacts were recovered at site 11-C-212, including 1 pottery sherd and 1 angular chert fragment. The small body sherd is identified as an Early Woodland Liverpool Incised sherd. It is characterized by a silty to sandy paste, fine to medium sand and crushed grit temper, brown in color, and incised external surface and smoothed interior. Thickness is approximately 5 mm. The angular chert fragment appears to be heat-treated Burlington chert.

Interpretation. The historic component at site 11-C-212 is interpreted as a late nineteenth-century rural habitation/farmstead and associated disposal/discard area. The site is buried beneath approximately 60 cm of historical alluvium, and extends to a maximum depth of 140 cm BS. The densest portion of the material scatter identified in the project area, including, perhaps, the remains of a structure built on a limestone foundation, appears to be concentrated in the northeastern corner of Borrow Area D, but the site may extend outside the project area to the northeast (Figure 20). A relatively light material scatter is present at the southwestern edge of the proposed borrow area, but the central portion of the site, as well as the remainder of the borrow area outside the site limits, does not appear to contain substantial cultural deposits (Figure 20).

The small size of the artifact collection makes functional interpretation difficult, but the presence of ceramics suggests the prehistoric component at site 11-C-212 may represent a field camp. The prehistoric component was identified at a depth of 115-125 cm below the modern ground surface. The areal extent of the prehistoric component has not been determined, but inside the project area it appears it is confined to the northeastern corner of Borrow Area D. It is possible that the site extends outside the project area to the northeast, to the higher ground located nearer the Illinois River. The prehistoric occupation at site 11-C-212 appears to date to the Early Woodland period.

CHAPTER VII. CONCLUSIONS AND RECOMMENDATIONS

Introduction

The project Scope of Work called for a Phase I archaeological survey and geomorphological evaluation of a 95 acre area within the Swan Lake HREP. The primary objectives of the geomorphological investigation were to determine the depth of the PSA (post-settlement alluvium) deposit across the project area, and to investigate the potential for buried cultural resources at locations where construction may extend below these recently-deposited sediments. The primary objectives of the archaeological survey were to identify historic properties located within the project area, and provide a preliminary assessment of their eligibility for listing to the National Register of Historic Places (NRHP).

All cultural properties located during the survey were to be evaluated in terms of the National Register of Historic Places (NRHP) criteria of significance (36CFR Sec. 60.6, Federal Register 1976). The criteria are:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and

- a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- b) That are associated with the lives of persons significant in our past; or
- c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) That have yielded, or may be likely to yield, information important in prehistory or history.

Criteria considerations: ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, commemorative in nature, and properties that have achieved their significance within the past 50 years shall not be considered eligible for the National Register of Historic Places.

Geomorphological Investigation

The geomorphological investigation conducted during the present survey included soil coring and backhoe trenching. The results of the investigation indicate that the depth of the PSA deposit covering the Swan Lake HREP exceeds the maximum depth of construction impact within most of the project area. These areas include the construction corridor of the exterior levee from 0+00 to 482+50, Borrow Area A, the Pump Station #1 and #2 construction areas, and the construction areas of both the northern and the southern boat ramps and associated parking lots. Construction in these areas will not impact soils having the potential to contain cultural resources, and, consequently, will not have an adverse effect on significant historic properties. It is recommended that construction proceed as planned in these areas.

The maximum depth of construction impact may extend below the PSA deposit within some portion of the final 250 feet (76 m) of the exterior levee construction corridor, but it is unlikely that the activities associated with levee construction and drainage swale excavation will impact soils having the potential to contain cultural resources in this area; the soil surface identified beneath the historic alluvium deposit in this area (ST-6) is a poorly drained soil that is not likely to have been suitable for prehistoric or historic occupation. Construction within the extreme northern end of the exterior levee construction corridor, and within the previously disturbed construction corridors of the northern and southern boat ramp access roads, is not likely to have an adverse effect on significant historic properties. It is recommended that construction proceed as planned in these areas.

The geomorphological investigation determined that the maximum depth of construction impact will extend below the PSA deposit within the western channel of Pump Station #1, the eastern channel of Pump Station #2, the Pump Station #3 construction area and associated channels, the construction corridor of the Pump Station #3 access road, and Borrow Areas B, C, D, and E. One or more somewhat poorly-drained to moderately well-drained, early to late Holocene soil surfaces were identified in the construction impact zone in the western channel of Pump Station #1 and the eastern channel of Pump Station #2. These soil surfaces are too deeply buried to be investigated through shovel testing, and intensive subsurface testing with a backhoe proved infeasible due to inaccessibility (Pump Station #2) or heavy timber (Pump Station #1). While the buried soils identified in these two areas have some potential to contain cultural resources, their areal extent within the construction impact zone is relatively small due to the narrowness of the pump station channels (21 m). Moreover, the depth of the channels decreases, and the depth of the PSA deposit increases, as distance to the Illinois River and Swan Lake

decreases, thus further limiting the portion of the channel corridor in which excavation is likely to extend below the historic alluvium. Consequently, it is recommended that excavation of the western channel of Pump Station #1 and the eastern channel of Pump Station #2 be monitored by an archaeologist. Should cultural material be identified during channel excavation, construction should be halted until an archaeological investigation of these resources is completed.

The results of the archaeological investigation conducted in the construction corridor of the Pump Station #3 access road, Borrow Areas B, C, D, and E, and the Pump Station #3 construction area and associated channels are presented below.

Archaeological Investigation

Screened shovel testing and systematic surface survey within the construction corridor of the Pump Station #3 access road, and intensive subsurface testing within Borrow Areas B and C failed to identify cultural resources. It appears that construction in these areas will not have an adverse effect on significant historic properties. It is recommended that construction proceed as planned in these areas.

The geomorphological investigation determined that PSA is not present in Borrow Area E, so this area was investigated through systematic surface survey. No cultural material was identified on the surface in the disced, well-washed field contained within this borrow area, and none was observed during careful examination of the walls of a single backhoe trench excavated in this area. It is possible, however, that the buried soil surfaces identified in Borrow Area E during the geomorphological investigation do contain cultural resources. Consequently, it is recommended that this portion of the project area be avoided. If avoidance is not feasible, it is recommended that additional subsurface testing be conducted in Borrow Area E before proceeding with the proposed construction.

A buried, dual-component site, site 11-C-212, was identified in Borrow Area D during intensive subsurface testing. The historic component at the site is interpreted as a late nineteenth-century rural habitation/farmstead and associated disposal/discard area. Most of the historic artifacts found at site 11-C-212, including the vast majority of architectural-related materials (limestone, brick, mortar, nails), were identified in four trenches located in the northeastern corner of the borrow area, suggesting that a structure may have been located in this portion of the site. If the pieces of limestone observed in the trenches are, in fact, the remains of a foundation, their small size suggests that the site has sustained a substantial degree of post-occupational disturbance, perhaps as a result of activities associated with the cultivation of the field containing the site following its abandonment, and prior to its being covered by PSA. Due to its relatively recent age, and questionable integrity, the historic component at site 11-C-212 does not appear to meet the NRHP criteria of significance, and, consequently, is evaluated as not potentially eligible for listing to the NRHP. No further archaeological work is recommended at the historic component at site 11-C-212.

The prehistoric component at site 11-C-212 is represented by a ceramic sherd and an angular chert fragment recovered from a deep-testing trench (T-13) excavated in the northeastern corner of Borrow Area D. The prehistoric component is interpreted as a field camp dating to the Early Woodland period. The prehistoric occupation is buried beneath approximately 1.15 m of PSA, and appears to be confined to the northeastern corner of the borrow area, inside the project area, but may extend outside the project area to the northeast. The prehistoric component at site 11-C-212 may meet the NRHP criteria of significance, and, consequently, is evaluated as potentially eligible for listing to the NRHP. It is recommended that the prehistoric component at the site be avoided by leaving intact a 3,000 m² area (60 m E/W x 50 m N/S) in the northeastern corner of Borrow Area D. If the prehistoric component at site 11-C-212 can not be avoided, it is recommended that Phase II investigations be undertaken at the site to further document its NRHP eligibility.

During the present investigation, previously recorded site 11-C-152, the Persimmon site, was found to extend into the proposed construction area of Pump Station #3. Because this portion of the site appears to contain an intact midden remnant associated with occupations dating to the Early Woodland, and possibly the Late Woodland, and may contain features associated with these components as well, it is evaluated as eligible for inclusion on the National Register of Historic Places (NRHP). It is recommended that the site be avoided. If the site can not be avoided, it is recommended that the adverse effects of proposed construction be mitigated through conducting a Phase III investigation involving limited hand excavations, extensive mechanical stripping, and a detailed geomorphological investigation of the portion of the site located inside the project area.

At a meeting with the St. Louis District and American Resources Group held on November 14, 1995, the Illinois Historic Preservation Agency concurred with the foregoing NRHP eligibility determinations for sites 11-C-152 and 11-C-212. In a letter to the St. Louis District dated February 9, 1995 (Appendix C), the State Historic Preservation Officer concurred with the recommendation that the anticipated adverse effects on site 11-C-152 of the activities associated with the proposed construction of Pump Station #3 be mitigated through conducting a Phase III investigation involving limited hand excavations, extensive mechanical stripping, and a detailed geomorphological investigation of the portion of the site located inside the project area.

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APPENDIX A
SCOPE OF WORK

Phase I Archaeological Survey for
Historic Properties Within the Swan Lake
Habitat Rehabilitation Enhancement Project (HREP),
Environmental Management Program,
Pool 26, Illinois River
Calhoun County, Illinois
Delivery Order No.

1. Statement of Work. The purpose of this delivery order is to conduct Phase I archaeological survey for historic properties within the Swan Lake Habitat Rehabilitation Enhancement Project (HREP), Environmental Management Program (EMP) located in Pool 26, Illinois River (mile 5.0 to mile 13.0 along the right [west] bank), Calhoun County, Illinois. Swan Lake HREP includes the Fuller Lake State Fish and Waterfowl Management Area, Illinois Department of Conservation (IDOC) and part of the Calhoun Division, Brussels District, Mark Twain National Wildlife Refuge, U.S. Fish and Wildlife Service (FWS). All work accomplished by the A-E will be reviewed and approved by the Corps of Engineers, St. Louis District.

1.2 The main objective of this delivery order is to locate and identify historic properties present within areas to be impacted by the Swan Lake EMP-HREP.

1.3. The major constituents of the delivery order are: 1) Phase I pedestrian and shovel/soil core assisted subsurface survey sufficient to determine the location of historic properties potentially eligible for the National Register of Historic Places (NRHP) which may be affected by the construction of the riverside (exterior) levee, one interior closure, five borrow areas and one borrow trench, one lower closure between Swan Lake and the Illinois River, one drainage swale, one relocated road, one road closure, three pump stations with channels and control structures, two boat ramps with parking lots and access roads, and two island groups. 2) geomorphological support with hand coring and/or subsurface testing to document areas within the construction area with little or no potential to contain historic properties, 3) documentation based upon archival sources, subsurface testing and visual assessments sufficient to determine project impacts, 4) preparation of a high quality technical report on the archaeological and geomorphological results of the investigations which meets the Corps Scope of Work and the Illinois State Historic Preservation Office Guidelines for Archaeological Reconnaissance Surveys/Reports, 5) recommendations for any Phase II testing necessary to determine NRHP eligibility.

6) A meeting will be held to discuss the possibility of locating the 1680 Tamaroa Indian massacre site and/or a later historic Indian Village site or sites within the proposed project area. The meeting has been requested by the Illinois State Historic Preservation Officer, who suggested other regional archaeologists as attendees.

2. Project Description. The St. Louis District is proposing to construct a riverside levee, an interior levee, three pumping systems with water control structures and lake dredging. See attached map for general construction locations, but also see sec. 2.3 and 12.1 below. The purpose of the project is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in the three lake units. This project is a part of the Environmental Management Program which was established by PL-99-662 to enhance and rehabilitate the Upper Mississippi River system. The proposed project is located on Corps of Engineers fee land managed by the IDOC and FWS.

2.1 Water levels at the Swan Lake complex have been controlled by regulation at the Mel Price Locks and Dam located downstream since 1990. From 1933 to 1990, the water levels were controlled by the previous Lock and Dam 26. As a consequence of dammed water backing up the Illinois River, Swan Lake is inundated for a portion of each year. This inundation has led to sedimentation of varying thicknesses across the project area; an average of .5 inch of silt deposition per year across the project area was estimated in the Definite Project Report. Approximately 5 feet of silt has been deposited in the lake bed since 1903, raising its elevation from 414 to 419 feet NGVD. No information of depth of recent silt in the vicinity of the proposed levee is available.

2.2 The land portions of Swan Lake HREP will not experience an increase in inundation due to the EMP project. The pool stage along the Illinois River here and the normal lake level are 419 NGVD. The western portion of the Swan Lake area lies between the 420 and 425 contour lines, except at the bluff base where the elevation rises above 425. The entire Swan Lake area floods to 424.5-425.5 elevation on average every two years and to 429.9430.6 elevation on average every 5 years. Therefore no investigations will be conducted in areas other than the construction zones.

2.3 Possible construction impacts are discussed below. Because plans and specs have not been finalized, a field visit during which Corps engineers point out survey locations will be necessary (see 12.1 below).

2.3.1. Riverside (exterior) levee will consist of an approximately 8.9 mile (on land) low profile earthen levee (center line is staked) more or less parallelling the Illinois River shore line. The clearing, levee construction and staging areas will be confined to a corridor not to exceed 60 feet. Depth of ground disturbance associated with levee construction is 1 - 2 feet. After vegetation clearing and grubbing the levee footprint will be disced to a depth of 6 inches. The northern 6850 feet of levee will cross agricultural fields; the remainder will be in woods, but has been placed to minimize tree removal. An approximately 2000 feet section will cross open water at the south end of Swan Lake and will not require survey. The southern end of the levee is in an agricultural field and may cross the Persimmon site (see 3, below).

2.3.2 A relocated road will be constructed from the levee to an existing IDOC boat ramp (see plans). The road corridor will be approximately 3300 feet long by 25 feet wide. Grading will disturb only the upper 6 inches of the ground surface. The road location is an agricultural field.

2.3.3 A shallow swale to improve drainage will be constructed between sta. 469 + 00 and 482 + 00. The swale will be 1300 feet long by a maximum of 30 feet wide by a maximum of 2 feet deep. The swale will cross an agricultural field.

2.3.4 Five potential borrow areas have been designated; all are in agricultural fields (plans & map). Borrow areas are irregularly shaped, but will extend a maximum of 5 feet below the surface. Total borrow area is about 25 acres. Note: Borrow Area B is located about 300 feet north of the possible location Middle Woodland Mound Site 11C23, and will be used only if insufficient borrow is available at Borrow Areas A and C. Borrow locations will be pointed out during the field visit (see 12.1 below).

2.3.5 Three pump stations will disturb areas approximately 600 feet x 90 feet x 12 feet deep (maximum) each. Each pump station project area includes channels to the Illinois River and Swan Lake. A water control structure will be included in the construction area of each pump station. Pump station 1 (upper, IDOC) apparently is located in a field. Pump station 2 (middle, FWS) is apparently located in woods. Pump station 3 (lower, FWS) is apparently located in woods on the eastern side of the lake in the vicinity of the early Late Woodland Persimmon site.

2.3.6 Two boat ramps with parking lots each will disturb areas about 200 feet x 200 feet x 6 inches deep. The southern ramp (River mile 5.9) is located in woods; the access road is 1200 feet long. The northern ramp (at River Mile 9.0 relocated from 9.2) is

located on a field; the access road is about 1000 feet long. Both access roads will be 12 feet wide. Disturbance will be about 6 inches deep, except in areas of tree removal, where disturbance will extend to about two feet.

2.3.7 The interior closure, separating Lower and Middle Swan Lake, will be constructed across open water. Only the two ends on land will be surveyed as part of the delivery order.

2.3.8 The two island groups and the borrow trench for most of the levee on the FWS portion will be constructed entirely underwater and will not be surveyed as part of this delivery order. In addition, a portion of the lake will be dredged to 412 NGVD to provide fill for the FWS levee, closures and islands. Dredging will remove post 1903 sediments to a depth of 414 NGVD feet, but will remove earlier sediments between 414 and 412 feet NGVD. Survey of the dredging area will not be included in this delivery order.

3. Background. Correspondence with the Illinois Historic Preservation Agency (IHPA) dated May 9, 1994 indicated that one prehistoric site may be located within the construction area: Site 11C23 may be located about 130 feet south of the southern end of borrow area #B, but according to a regional archaeologist is probably actually located a mile to the north outside the project area. In addition, the early Late Woodland Persimmon site is located in the vicinity of the levee's south end and pump station 3. A survey of the Illinois River shoreline was conducted in the mid-1970s by the Contract Archaeology Program, Kampsville, Illinois for the St. Louis District. While the survey corridor extended 300 ft. back from the shoreline, only visible ground was examined and apparently no subsurface testing was conducted. Thus the lack of documented shoreline sites other than the Persimmon site may result from poor ground visibility.

Artifact scatters along the Illinois shore of the lake from the mouth of Sixmile Slough downstream to the project's south end have been reported. Some archaeologists believe that the 1680 Tamaroa Indian massacre site is now inundated by Swan Lake. Recent reports of historic (18th century) Indian artifacts from the Illinois shore, have been received. However, other recent documentary research suggests the massacre occurred at present Marshalls Landing outside the project area. Two other known sites in the vicinity should not be impacted by construction. The Dear Plain Point Mound Site (probably Middle Woodland) is located about 2000 feet southwest of the large borrow area near the project's south end. The Juice Site (Middle Woodland) is located about 3000 feet southeast of the south borrow area and is on the west side of the black top highway.

4. Specifications.

4.1 A literature search will be conducted to provide a succinct prehistoric and historic overview pertaining to the immediate area. The literature search will include, but not necessarily be confined to, archaeological site reports and site forms, plat books, atlases, maps, General Land Office maps and surveyor notes, county histories, soil series maps, and other relative documentation. The IDOC and FWS managers shall be contacted concerning possible archaeological sites unrecorded with IHPA which might be impacted by construction. Regional archaeologist Ken Farnsworth, Center for American Archaeology, Kampsville at (618) 653-4316 may be contacted concerning archaeological sites in the project area, including the Persimmon site.

4.2 In conjunction with the pedestrian survey, the A-E shall hand excavate, handheld soil corer and/or use heavy equipment necessary to investigate the subsurface potential for buried cultural resources at locations where construction may/will extend below the zone of recent silt deposition. Examination of existing maps and geomorphological data should precede the detailed field investigations. It is anticipated that survey of the levee construction corridor, swale and roads (totalling about 64.4 acres) will require 2 transects with shovel tests and/or hand held core at 15 minuet intervals. In agricultural fields where recent surficial silt deposition is determined to be negligible and where construction will not impact below the plow zone, pedestrian survey along transects at 15 m intervals will be sufficient. The borrow areas, pump stations, and boat ramps (totalling about 30.6 acres) will be similarly tested on a 15 m grid in the nonaquatic portions only. About 95 acres will be impacted by construction. Additional subsurface testing may be required at pump stations and borrow areas where construction will extend beyond the depth of the handheld corer.

4.3 The vicinity of site 11C23 shall be investigated to determine whether the site is present and if so, the possibility of impacts from borrow activities in Borrow Area B shall be determined. Possible impacts to the Persimmon site also shall be determined. These sites (and any other sites found to be located close to proposed construction areas) shall be flagged with a 35 foot buffer zone so that they can be avoided during construction.

4.4 Mid-18th century artifacts reportedly have been collected along the Illinois river shoreline at low water from the mouth of Sixmile slough to the project's south end. The exposed shoreline between the slough mouth and project and (except where obscured by dead fales, etc.) shall be surveyed. Since the shoreline may be covered with recent silt, older surfaces such as the underside of

tree uproots and erosion crevasses shall be thoroughly visually examined. The presence of archaeological material within two feet of the surface shall be determined also by shovel test or hand held cover. The depth of silt, down to two feet below surface, shall be noted.

4.5 The A-E shall discuss the general implications of the documentary and geomorphological results within the framework of site management. The majority of the geomorphological analysis shall be limited to field interpretation with only very limited lab analysis necessary to archaeological interpretation, site integrity and stratigraphic limits. A maximum of three C14 samples may be required. The geomorphological investigations shall be conducted in support of the detailed archaeological interpretation and determination of site integrity and stratigraphic limits. Also, results of the geomorphological investigations should be discussed in the context of the geomorphological study of the lower Illinois River valley previously prepared for the St. Louis District (St. Louis District Historic Properties Management Report No. 34).

4.6 The A-E shall provide a sufficient level of investigation (documentary, archaeological, and geomorphological) for the St. Louis District to assess the potential for the proposed construction areas to contain significant archaeological and architectural sites. Both historic and prehistoric sites will be addressed. Complete legal descriptions will be provided. Appropriate site forms will be submitted to the St. Louis District. All sites shall be plotted on U.S.G.S. topographical maps and submitted with the final report.

4.7 The A-E shall make recommendations for any Phase II testing that may be necessary to determine NRHP eligibility of each resource encountered as well as indicate the condition of the resource and potential impacts. The A-E shall also indicate those resources that will require no additional investigations. A formal determination of eligibility is not a requirement of this work order. However, any resource which can be clearly evaluated as eligible or not eligible for listing on the NRHP should be evaluated and included in the report recommendations.

4.8 Photographs: Photographs shall be black and white prints and color slides prepared in accordance with the enclosed Cultural Resource Investigations, Part I, Section 7.2.5 and 7.2.6. These photographs shall show details of field conditions, features, profiles, artifacts, or other evidence of past cultural activity. The black and white prints included in each copy of the final report shall be selected as specified in paragraph 7.1 below.

4.9 Monumentation and Contour Mapping. The A-E is responsible for establishing a site datum at each site located using survey monuments provided by the Government.

4.10 Laboratory Procedures. Artifacts collected during survey shall be cleaned, permanently labeled, and catalogued according to the enclosed Part II, St. Louis District Curation Standards. The A-E shall analyze the collection by separating the artifacts into appropriate material categories, then subdividing as needed into smaller, functional and stylistic categories. Basic analytical studies include, but are not limited to:

a. Lithic analysis. This shall include a description of morphological, functional, and stylistic attributes, as well as the identification of raw material. Analysis shall also determine intrasite and local relationships.

b. Ceramic analysis. This shall include a description of morphological and stylistic attributes, and shall also identify intrasite and local relationships.

5. Conferences: Conferences shall be held in accordance with Section 12.1, below, Post-Award Meeting. A conference shall be held after conclusion of the laboratory analysis for the purpose of inspecting and monitoring the preparation of collected materials for storage and retrieval.

6. Location and Description of the Study Area: A map showing the project location and construction areas shall be furnished to the A-E by the Government. A Government representative familiar with the project location will accompany the A-E during the initial project inspection.

7. Reporting:

7.1 Draft Report. The A-E shall submit a draft report which shall be a complete and accurate representation of the final report. The report shall be a technical report of the results of the survey and geomorphological investigations and also shall include discussion of how the results of the work will contribute to the present understanding of the Illinois River valley culture history and the Corps landscape model. The draft (and final) report shall include photographs and/or graphics which shall accurately show: 1) the location and topographic position of any sites recorded; 2) the location of subsurface cores and 3) the details of any features, profiles, artifacts, or any other

cultural evidence. The draft report shall be typed and double spaced, and three (3) copies shall be provided to the Project Archaeologist. All pages shall be numbered. The draft shall be completely proofread so that it shall be free of typographic errors and other editorial deficiencies. Drawings, tables and other non-photographic illustrations shall appear in the same quality, size, format, and location in the draft report as they will be in the final report. Photographs shall not be enlarged and reproduced for the draft report. The A-E shall submit contact prints with recommendations for those to be included in the final report to the Project Archaeologist. The Project Archaeologist will review these and select those to be included in the final report. The A-E shall then be responsible for enlargement and reproduction according to the enclosed Cultural Resource Investigations, Part I, Section 7.2.5.

7.2 Final Report. The final report shall be prepared in accordance with the enclosed Cultural Resource Investigations, Part I, Section 7.2. Maps and drawings may be prepared using either mechanical or computer generated lettering and shall be in accordance with good drafting practice.

8. Government Furnished Information: The Government shall furnish to the Contractor the following items: (1) St. Louis District Report Format Requirements, (2) St. Louis District, Swan Lake Complex, Habitat Rehabilitation and Enhancement Project Plans and Specifications, presently available, (3) USGS 7.5 minute topographic map showing the project location, (4) Survey Monuments (as needed). These items shall be forwarded under separate cover.

9. Contractor Capability: It is anticipated that the following personnel types may be required at some point during the completion of the delivery order: (1) Principal Investigator (1), (b) Field Supervisor (1), (c) Lab Supervisor (1), (d) Lab Assistant (1), (e) Field Archaeologist (2), (f) Geologist (1), (g) Clerical (1), (h) Data Processing Technician (1), and (i) Draftsman (1). A boat, backhoe, and geomorphological equipment may be required.

10. Publicity: The A-E shall not release any information to the public without written approval of the St. Louis District Commander. It is not the Government's intent to restrict in any way the A-E's desire to publish in scholarly or academic journals.

11. Right-of-Entry. The land in the contract area is Federally owned. At least one week prior to beginning field work, the Contractor shall notify Ms. Suzanne Harris, Project Archaeologist for the Swan Lake construction project, St. Louis District office at (314) 331-8467. At the same time, the Contractor shall also notify Mr. Neil Booth, Manager, IDOC, Mississippi River Fish and Wildlife Area office at (618) 376-3303 and Ms. K. L. Drews, Refuge Manager, FWS, Brussels District, Mark Twain National Wildlife Refuge at (618) 883-2524. The A-E shall arrange to obtain keys for any gates in either IDOC or FWS areas.

12. Schedule of Work:

12.1 Post-Award Meeting. After the issuance of the delivery order, the A-E (including the field supervisor and the principal investigator) shall meet with the Project Archaeologist and other Government representatives. This conference shall take place on or before 10 October 1994. At this meeting the project Study Manager, Joe Kellett (314) 331-8039 shall discuss the southern 2/3 of the project area for which plans and specs are not yet available. The remainder of the day shall be spent in the field where the A-E will be shown specific project element locations. The meeting shall take place in the Wildlife Division office.

12.2 Meeting 2. This meeting shall occur at the approximate 50% completion point of field work and shall take place at the Swan Lake project area. The A-E shall contact the Project Archaeologist to arrange meeting.

12.3 Meeting 3. This meeting shall occur at the completion of the artifact analysis/processing and prior to transmittal of The artifacts and documents to the Illinois State Museum. This meeting shall take place in the Contractor's office.

12.4 Field Work. All field work shall be completed immediately after the issuance of the delivery order.

12.5 Preliminary Field Results Letter. A brief letter report detailing the preliminary field results with initial management options for a Phase I no effect or Phase II archaeological testing/mitigation shall be provided to the St. Louis District seven days after completion of the field work. Preliminary results on the northern project area shall be provided by phone by 14 October 1994.

12.6 Analysis and Draft Report. Artifact analysis and draft report preparation shall be completed with 60 calendar days following award of the contract.

12.7 Review. Government review comments will be furnished to the Contractor within 30 calendar days after receipt of the draft report. The Government shall conduct coordination with the Illinois State Historic Preservation Officer and the Illinois Department of Conservation.

12.8 Final Report. The final report shall be submitted to the Government within 30 calendar days following receipt of the draft review comments.

13. Time Extensions. In the event the schedules in paragraph 12 above are exceeded due to causes beyond the control and without the fault or negligence of the Contractor, as determined by the Contracting Officer, the delivery order shall be modified in writing and the contract completion date extended one calendar day for each calendar day of allowable delay.

14. Site Backfilling & Revegetation. The A-E shall backfill all excavation units as soon as they have been recorded, unless specific units need to be left open for further inspection, after which they shall be backfilled.

APPENDIX B
SOIL PROFILE DESCRIPTIONS

SITE NAME: ST1, Swan Lake HREP
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 220cm.
 SLOPE: 0-2%
 VEGETATION: Softwood forest.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Thick bedded massive PSA over poorly drained wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-190	C	10YR 4/4 - 3/3; silt loam and loam; massive; friable; PSA flood laminae; few fine faint mottles below 50cm; some units leached others unleached; abrupt smooth.
190-240	ACgb	N2/0; silty clay loam; massive; sticky; many fine root holes; pH 8.0.

SITE NAME: ST2, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: field.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Thick bedded massive PSA to 90cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-90	C	10YR 4/4 - 3/3 - 3/2; silt loam and loam; weak medium platy to massive; friable; PSA flood laminae; few to common fine roots; some units leached others unleached; abrupt smooth.
90-140	Ab	10YR 2/1; silt loam; moderate medium granular; friable; many fine root holes; few medium distinct mottles; leached; clear wavy.
140-170	Bwgb	10YR 3/1; silty clay loam; moderate medium granular; friable; many fine root holes; common medium distinct mottles; leached; clear wavy.
170-180	Cgb	N3/0-4/0; silty clay loam; massive; sticky; leached.

SITE NAME: ST3, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: field.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Thick bedded massive PSA to 100cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-100	C	10YR 4/4 - 3/3 - 2/2; silt loam; weak medium granular and weak medium subangular blocky; friable; PSA flood laminae; many fine roots and root holes; both leached and unleached laminae; abrupt smooth.
100-140	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine roots; leached; clear wavy.
140-170	Bwgb	10YR 4/2 - 3/1; silt loam; moderate medium subangular blocky; friable; common medium distinct mottles; many fine root holes; leached; gradual smooth.
170-180	Cgb	N3/0-4/0; silty clay loam; massive; sticky; leached.

SITE NAME: ST4, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: field.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Thick bedded massive PSA to 85cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-85	C	10YR 4/4 - 3/3 - 2/2; silt loam; weak medium platy to massive; friable; PSA flood laminae; many fine roots and root holes; both leached and unleached laminae; abrupt smooth.
85-130	Ab	10YR 2/1; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine roots; few fine faint mottles; leached; clear wavy.
130-175	Bwgb	N3/0; silty clay loam; moderate medium subangular blocky; sticky; few medium distinct mottles; many fine root holes; few argillans; horizon trends toward a Btg; leached; gradual smooth.
175-180	Cgb	10YR 3/1; silty clay loam; massive; sticky; leached.

SITE NAME: ST5, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: field.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Thick bedded massive PSA to 70cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-70	C	10YR 4/4 - 3/3 - 2/2; silt loam; weak medium granular to massive; friable; PSA flood laminae; many fine roots and root holes; both leached and unleached laminae; abrupt smooth.
70-120	Ab	10YR 2/1; silt loam; moderate medium granular; friable; many fine roots; few fine faint mottles; leached; clear wavy.
120-180	Btgb	N3/0; silty clay loam; moderate medium subangular blocky; sticky; few medium distinct mottles; many fine root holes; few argillans; leached; gradual smooth.

SITE NAME: ST6, Swan Lake HREP

GEOMORPHIC SURFACE: Early to Mid (?) Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: Below bottom of core.

SLOPE: 0-2%

VEGETATION: field.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/10/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA to 50cm, below lies a possible early to mid Holocene soil. Poorly drained, probably a channel or swale fill.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-50	C	10YR 2/2; silt loam to silty clay loam; weak medium granular to massive; friable; both leached and unleached units; abrupt smooth.
50-110	ABgb	N 2/0; silty clay loam; moderate medium subangular blocky; sticky; many fine roots; few fine faint mottles; leached; gradual smooth.
110-160	Btgb	5Y 4/1; silty clay loam; moderate to strong medium subangular blocky; sticky; few medium distinct mottles; many fine root holes; few argillans; leached; gradual smooth.
160-180	BCKb	10YR 3/1; silty clay loam; massive; sticky; secondary carbonates; unleached.

SITE NAME: ST7, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: field.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 80cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-80	C	10YR 4/4 - 2/2; silt loam; weak medium granular to massive; friable; PSA flood laminae; many fine roots and root holes; both leached and unleached laminae; abrupt smooth.
80-120	Ab	N 2/0; silt loam; moderate medium subangular blocky; friable; many fine roots; common medium distinct mottles; leached; clear wavy.
120-140	Btgb	N 3/0; silty clay loam; moderate medium subangular blocky; sticky; common medium distinct mottles; common fine root holes; few argillans; leached; gradual smooth.
140-180	BCgb	5Y 4/1; silty clay loam; moderate medium subangular blocky; sticky; mottled and gleyed; leached.

SITE NAME: ST8, Swan Lake HREP, Borrow Area A
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 200cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 220cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 150cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-150	C	10YR 4/4 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
150-190	Ab	N 2/0; silty clay loam; moderate medium subangular blocky; sticky; many fine roots; common medium distinct mottles; leached; clear wavy.
190-220	Btgb	10YR 4/1; silty clay loam; moderate medium subangular blocky; sticky; common medium distinct mottles; common fine root holes; leached.

SITE NAME: ST9, Swan Lake HREP, Borrow Area A

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: Below depth of core.

SLOPE: 0-2%

VEGETATION: Willows.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 220cm

DATE DESCRIBED: 10/10/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 165cm, below lies a very poorly drained late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-165	C	10YR 4/4 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
165-200	ACgb	N 2/0 - 3/0; silty clay loam; moderate medium subangular blocky; sticky; few fine roots; common medium distinct mottles; gleyed; leached; gradual smooth.
200-220	Cgb	N 4/0; silty clay loam; weak medium subangular blocky to massive; sticky; common medium distinct mottles; gleyed; leached.

SITE NAME: ST10, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 210cm.
 SLOPE: 0-2%
 VEGETATION: Sunflowers.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 220cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 160cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-160	C	10YR 3/3 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
160-210	ACb	N 2/0 - 3/0; silty clay loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; common medium distinct mottles; gleyed; leached; clear wavy.
210-220	Cgb	10YR 4/1; silty clay loam; massive; sticky; common medium distinct mottles; gleyed; leached.

SITE NAME: ST11, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface (levee).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below depth of core.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 220cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 130cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-130	C	10YR 3/3 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
130-170	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; leached; clear wavy.
170-210	Bwb	10YR 4/2; silty clay loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; leached; clear wavy.
210-220	Cb	10YR 4/2; silt loam; massive; friable; leached.

SITE NAME: ST12, Swan Lake HREP, Borrow Area B
 GEOMORPHIC SURFACE: Late Holocene surface (levee).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below depth of core.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 100cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-100	C	10YR 3/3 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
100-140	Ab	10YR 2/2; silt loam; moderate medium granular; friable; many fine root holes; leached; clear wavy.
140-180	Bwb	10YR 4/2; silty clay loam; moderate medium subangular blocky; friable; common fine root holes and fine roots; common medium distinct mottles; common fine Fe concretions; leached.

SITE NAME: ST13, Swan Lake HREP, Borrow Area B
 GEOMORPHIC SURFACE: Late Holocene surface (levee).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 60cm.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 120cm
 DATE DESCRIBED: 10/10/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 65cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-65	C	10YR 4/3 - 2/2; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
65-90	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; common medium distinct mottles; leached; clear wavy.
90-120	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; sticky; common fine root holes and fine roots; many medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST14, Swan Lake HREP, Borrow Area C
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 120cm.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 200cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 80cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-80	C	10YR 3/3; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
80-110	Ab	10YR 2/2; silt loam; moderate medium subangular blocky; friable; many fine root holes; few medium distinct mottles; leached; clear wavy.
110-150	Bwb	10YR 4/2; silty clay loam; moderate medium subangular blocky; sticky; many fine root holes and fine roots; common medium distinct mottles; common medium Fe concretions; leached; gradual smooth.
150-200	Cb	10YR 4/2: silt loam; massive; sticky; many medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST15, Swan Lake HREP, Borrow Area C

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 60cm.

SLOPE: 0-2%

VEGETATION: Silver maples.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm

DATE DESCRIBED: 10/11/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 130cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-130	C	10YR 4/3; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
130-240	Cg	10YR 4/2; silt loam; weak medium subangular blocky to massive; gleyed; leached.

SITE NAME: ST16, Swan Lake HREP, Borrow Area C
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 40cm.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 50cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-50	C	10YR 3/2; silt loam; massive; sticky; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
50-75	ABb	10YR 3/2 - 3/1; silt loam; moderate medium granular; friable; common fine root holes; water filling interstices; few fine faint mottles; leached; clear wavy.
75-125	Bgb	10YR 3/1; silt loam; moderate medium subangular blocky; sticky; saturated; common fine root holes and fine roots; common medium distinct mottles; common medium Fe concretions; leached; gradual smooth.
125-180	BCgb	10YR 4/2; silt loam; weak medium subangular blocky; sticky; saturated; many medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST17, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: Sunflowers.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 90cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-90	C	10YR 3/2; silt loam; weak medium granular and weak medium subangular blocky; friable; PSA flood laminae; few fine roots and root holes; few sand laminae; both leached and unleached laminae; abrupt smooth.
90-105	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common fine root holes; leached; clear wavy.
105-150	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; leached; abrupt smooth.
150-180	Ab2	10YR 2/3; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; few medium Fe concretions; leached.

SITE NAME: ST18, Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 170cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 110cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-110	C	10YR 3/3 - 4/4 - 6/4; silt loam and loam; weak medium platy to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
110-125	ABb	10YR 2/2 - 3/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; leached; clear wavy.
125-160	Bwb	10YR 4/2; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; few medium Fe concretions; leached; clear wavy.
160-170	BCb	10YR 3/1; silt loam; weak medium subangular blocky; friable; common fine root holes; common medium distinct mottles; leached.

SITE NAME: ST19, Swan Lake HREP, Borrow Area D

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: Below bottom of core.

SLOPE: 0-2%

VEGETATION: Silver maples.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm

DATE DESCRIBED: 10/11/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 120cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-120	C	10YR 3/3 - 4/4; silt loam and loam; weak medium platy to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
120-160	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; few fine faint mottles; leached; clear wavy.
160-210	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; common medium distinct mottles; few medium Fe concretions; leached; gradual smooth.
210-240	Cb	10YR 4/3: silt loam; massive; sticky; common medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST20, Swan Lake HREP, Borrow Area D
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of core.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 60cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-60	C	10YR 3/3 - 4/4 - 2/2; silt loam and loam; weak medium platy to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
60-90	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common to many fine root and worm holes; leached; clear wavy.
90-140	Bwb	10YR 4/2; silt loam; moderate medium subangular blocky; friable; many fine root and worm holes; common medium distinct mottles; few medium Fe concretions; leached; gradual smooth.
140-180	BCb	10YR 3/2; silt loam; weak medium subangular blocky to massive; sticky; common medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST21, Swan Lake HREP
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 180cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 180cm, below lies a very late Holocene to historic soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-180	C	10YR 6/3 - 4/4 - 2/2; silt loam, silty clay loam and loam; weak medium platy to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
180-190	ACb	10YR 3/2; silt loam; moderate medium subangular blocky; sticky; common medium distinct mottles; few medium Fe concretions; leached; gradual smooth.
190-240	Cb	10YR 4/2; silt loam; massive; sticky; leached.

SITE NAME: ST22, Swan Lake HREP

GEOMORPHIC SURFACE: Very late Holocene to historic surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 80cm.

SLOPE: 0-2%

VEGETATION: Silver maples.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/11/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 100cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-100	C	10YR 3/3 - 2/2; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
100-180	ACgb	N 3/0; silty clay loam; weak medium subangular blocky to massive; sticky; gleyed; leached.

SITE NAME: ST23, Swan Lake HREP, Pump station 2
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 100cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 390cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 120cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-120	C	10YR 3/3 - 2/2; silt loam, loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; both leached and unleached laminae; abrupt smooth.
120-150	ACgb	N 2/0 - 3/0; silty clay loam; weak medium subangular blocky to massive; sticky; gleyed; leached; gradual smooth.
150-390	Cgb	N 3/0; silty clay loam; massive; sticky; becoming 10YR 4/1 by 250cm; few loamy flood laminae; shells at 370cm; gleyed; leached.

SITE NAME: ST24, Swan Lake HREP, Pump station 2
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 200cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 390cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 140cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-140	C	10YR 3/3 - 2/2 - 4/4; silt loam, loam, and silty clay loam; massive; friable; PSA flood laminae; both leached and unleached laminae; abrupt smooth.
140-160	ABb	10YR 3/3; silt loam; moderate medium subangular blocky; friable; many fine root holes; few fine faint mottles; leached; clear wavy.
160-220	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; leached; gradual smooth.
220-390	Cg	10YR 4/2; silt loam; massive; sticky; many medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST25, Swan Lake HREP

GEOMORPHIC SURFACE: Very late Holocene to historic surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 120cm.

SLOPE: 0-2%

VEGETATION: Silver maples, cottonwoods.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/13/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 130cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-130	C	10YR 4/4 - 2/2; silt loam, loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; both leached and unleached laminae; abrupt smooth.
130-160	ACgb	N 2/0; silty clay loam; massive; sticky; few fine roots; gleyed; leached; gradual smooth.
160-180	Cgb	N 3/0; silty clay loam; massive; sticky; gleyed; leached.

SITE NAME: ST26, Swan Lake HREP
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 20cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples, cottonwoods.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 240cm. Very poorly drained wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-240	Cg	N 2/0 - 3/0; silty clay loam; massive; sticky; both leached and unleached deposits; gleyed fine grained channel fill.

SITE NAME: ST27, Swan Lake HREP
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 40cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples, cottonwoods.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 180cm. Poorly drained soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-180	Cg	10YR 6/3 - 4/4 - 2/2; loam, silt loam and silty clay loam; weak medium platy to weak medium granular; friable; some laminae >1.0cm; mottling below 140cm; both leached and unleached laminae.

SITE NAME: ST28, Swan Lake HREP

GEOMORPHIC SURFACE: Very late Holocene to historic surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 80cm.

SLOPE: 0-2%

VEGETATION: Silver maples, cottonwoods.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/13/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 160cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-160	C	10YR 6/4 - 4/4 - 2/2; silt loam, loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae some >1.0cm; both leached and unleached laminae; gradual smooth.
160-180	Cgb	N 3/0; silt loam; massive; sticky; common medium distinct mottles; partially decomposed wood at 160cm; gleyed; leached.

SITE NAME: ST29, Swan Lake HREP

GEOMORPHIC SURFACE: Very late Holocene to historic surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 60cm.

SLOPE: 0-2%

VEGETATION: Silver maples, cottonwoods.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/13/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 70cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-70	C	10YR 6/4 - 4/4 - 2/2; silt loam, loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae some >1.0cm; both leached and unleached laminae; gradual smooth.
70-180	ACgb	N 2/0 - 3/0; silt loam and silty clay loam; massive; sticky; common medium distinct mottles; gleyed; leached.

SITE NAME: ST30, Swan Lake HREP Persimmon site
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 10cm.
 SLOPE: 0-2%
 VEGETATION: Mixed hardwoods and silver maples, cottonwoods.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 170cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: Very recent PSA laminae to 10cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-10	C	10YR 6/4; coarse sand; single grained; loose; 1993 PSA flood laminae; leached; abrupt smooth.
10-30	ACg	N 2/0; silt loam; massive; sticky; common medium fine roots; leached; gradual smooth.
30-170	Cg	N 3/0; silt loam, loam and sandy loam; massive to single grained; gleyed; leached.

SITE NAME: ST31, Swan Lake HREP Persimmon site
 GEOMORPHIC SURFACE: Eroded early Holocene capped by late Holocene (?).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 180cm.
 SLOPE: 2-5%
 VEGETATION: Mixed hardwoods and silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 240cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: No PSA, possible early Holocene red and grey silts at base of profile.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-30	A	10YR 2/2; silt loam; moderate medium granular; friable; many fine root holes; leached; clear wavy.
30-90	Bw	10YR 4/4; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; leached; clear wavy.
90-110	BC	10YR 4/4; loam to sandy loam; weak medium subangular blocky; friable; coarsening with depth; leached; gradual smooth.
110-240	C	10YR 6/4; coarse sand; single grained; loose; apparent red and grey silt laminae near base of profile; leached.

SITE NAME: ST32, Swan Lake HREP Persimmon site
 GEOMORPHIC SURFACE: Early Holocene terrace.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below depth of core.
 SLOPE: 0-2%
 VEGETATION: Mixed hardwoods and silver maples.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 160cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: No PSA, early Holocene terrace.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-25	A	10YR 2/1; silt loam; moderate medium granular; friable; many fine root holes; leached; clear wavy.
25-90	Bt	10YR 4/4; silty clay loam; moderate medium subangular blocky; friable to hard dry; many fine root holes and fine roots; argillans; few fine faint mottles; leached; clear wavy.
90-140	BC	10YR 5/4; silt loam; weak medium subangular blocky; friable; common medium distinct mottles; common medium Fe concretions; leached; gradual smooth.
140-160	C	10YR 5/4; loam; massive; friable; common medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: ST33, Swan Lake HREP FWS (Southern) boat ramp
 GEOMORPHIC SURFACE: Very late Holocene to historic surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 1cm.
 SLOPE: 0-2%
 VEGETATION: Silver maples, cottonwoods.
 METHODOLOGY: Sampling tube core.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm
 DATE DESCRIBED: 10/13/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 160cm, below lies a very late Holocene to historic wetland soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-160	Cg	10YR 4/4, N 3/0; silt loam; massive; sticky; 1993 PSA flood laminae top 30cm; gleyed; both leached and unleached laminae; gradual smooth.
160-180	ACgb	N 2/0 - 3/0; silty clay loam; massive; sticky; few fine roots and organic matter; gleyed; leached.

SITE NAME: ST34, Swan Lake HREP, Meppen (Northern) boat ramp.

GEOMORPHIC SURFACE: Late to very late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 20cm.

SLOPE: 0-2%

VEGETATION: Weeds.

METHODOLOGY: Sampling tube core.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 180cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 100cm, below lies a poorly drained late to very late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-100	C	N 4/0; silty clay loam; massive; sticky; PSA flood laminae; both leached and unleached laminae; abrupt smooth.
100-110	Ab	N 2/0; silt loam; massive; sticky; common fine root holes; leached; clear wavy.
110-150	Bgb	10YR 4/2; silt loam; moderate medium subangular blocky; sticky; saturated; common fine root holes and fine roots; many medium distinct mottles; leached; gradual smooth.
150-180	Cgb	5Y 4/1; silty clay loam; massive; sticky; saturated; gleying; leached.

SITE NAME: Trench 1, Swan Lake HREP, Borrow Area B
 GEOMORPHIC SURFACE: Late Holocene surface (levee).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of trench.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Backhoe trench.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 175cm
 DATE DESCRIBED: 10/12/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 80cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-80	C	10YR 3/3 - 2/2; silt loam, loam and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
80-95	Ab	10YR 2/2; silt loam; moderate medium granular; friable; many fine root holes; leached; clear wavy.
95-110	Bwb	10YR 4/2; silty clay loam; moderate medium subangular blocky; friable; common fine root holes and fine roots; common medium distinct mottles; common fine Fe concretions; leached; clear wavy.
110-140	Ab2	10YR 3/2; silt loam; moderate subangular blocky breaking to moderate medium granular; friable; many fine root holes; common medium distinct mottles; common fine Fe concretions; leached; clear wavy.
140-175	Bwb2	10YR 4/2; silty clay loam; moderate medium subangular blocky; friable; common fine root holes and fine roots; common medium distinct mottles; common fine Fe concretions; leached.

SITE NAME: Trench 2, Swan Lake HREP, Borrow Area B
 GEOMORPHIC SURFACE: Late Holocene surface (levee).
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 140cm.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Backhoe trench.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 150cm
 DATE DESCRIBED: 10/12/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 65cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-65	C	10YR 4/3 - 2/2; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; charcoal at 55cm; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
65-95	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; common medium distinct mottles; leached; clear wavy.
95-150	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; sticky; common fine root holes and fine roots; many medium distinct mottles; common medium Fe concretions; few Mn smears; leached.

SITE NAME: Trench 3, Swan Lake HREP, Borrow Area C
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: 150cm.
 SLOPE: 0-2%
 VEGETATION: Weeds.
 METHODOLOGY: Backhoe trench.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 160cm
 DATE DESCRIBED: 10/12/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 70cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-70	C	10YR 3/2; silt loam, and silty clay loam; weak medium platy to massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
70-115	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; many fine root holes; few medium distinct mottles; leached; clear wavy.
115-160	Bwb	10YR 4/3; silty clay loam; moderate medium subangular blocky; sticky; many fine root holes and fine roots; many medium distinct mottles; many medium Fe concretions; leached.

SITE NAME: Trench 4, Swan Lake HREP, Borrow Area C

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 120cm.

SLOPE: 0-2%

VEGETATION: Weeds.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 130cm

DATE DESCRIBED: 10/11/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 70cm, below lies a very poorly drained late to very late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-70	C	10YR 2/2; silt loam; massive; friable; PSA flood laminae; common fine roots and root holes; both leached and unleached laminae; abrupt smooth.
70-130	ACgb	N 3/0; silt loam; weak medium subangular blocky to massive; sticky; many medium distinct mottles; many medium Fe concretions; gleyed; leached.

SITE NAME: Trench 5, Swan Lake HREP, Borrow Area C

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 95cm.

SLOPE: 0-2%

VEGETATION: Weeds.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 95cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 60cm, below lies a poorly drained late Holocene soil.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-60	C	10YR 2/2; silt loam; massive; sticky; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
60-95	ACgb	N 3/0; silty clay loam; moderate medium granular; sticky; common fine root holes; many medium distinct mottles; many medium Fe concretions; leached.

SITE NAME: Trench 6, Swan Lake HREP
GEOMORPHIC SURFACE: Late Holocene surface.
POSITION IN LANDSCAPE: Flat lying.
PARENT MATERIALS: Illinois River alluvium.
WATER TABLE: Below bottom of trench.
SLOPE: 0-2%

VEGETATION: Sunflowers.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 200cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 80cm, below lies a late Holocene soil. Two radiocarbon dates were obtained from the profile. 100-105cm 860+/- 60BP (Beta 77130), 190-200cm 1480+/- 70BP (Beta 77131). A moderately well drained profile.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-80	C	10YR 2/2; silt loam; weak medium granular and weak medium subangular blocky; friable; PSA flood laminae; few fine roots and root holes; few sand laminae; both leached and unleached laminae; abrupt smooth.
80-105	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common fine root holes; 860+/- 60BP (Beta 77130); leached; clear wavy.
105-150	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; leached; abrupt smooth.
150-200	Ab2	10YR 2/3; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; few medium Fe concretions; 1480+/- 70BP (Beta 77131); leached.

SITE NAME: Trench 7, Swan Lake HREP, Borrow Area D
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: Below bottom of trench.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Backhoe trench.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 200cm
 DATE DESCRIBED: 10/12/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 70cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-70	C	10YR 2/2; silt loam and loam; weak medium subangular blocky to massive; friable; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
70-105	Ab	10YR 2/2; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common to many fine root and worm holes; few medium distinct mottles; leached; clear wavy.
105-135	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root and worm holes; few argillans down channels; common medium distinct mottles; few medium Fe concretions; leached; gradual smooth.
135-165	ABb	10YR 3/3; silt loam; moderate medium subangular blocky; friable; many fine root holes; few argillans down channels; few fine faint mottles; leached; clear wavy.
165-200	BCb	10YR 4/3; silt loam; weak medium subangular blocky to massive; sticky; common medium distinct mottles; common medium Fe concretions; leached.

SITE NAME: Trench 8 Pump station #1

GEOMORPHIC SURFACE: Very late Holocene to historic surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 300cm.

SLOPE: 0-2%

VEGETATION: Silver maples, cottonwoods.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 360cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 270cm, below lies an apparent historic aged wetland soil.

Radiocarbon date on wood at 350cm 20+/- 70BP (Beta 77132) historic date.

DEPTH CM	SOIL HORIZON	DESCRIPTION
	OR DEPOSITIONAL UNIT	
0-270	C	10YR 6/3 - 3/3 - 4/4; silt loam; massive; sticky; 1993 PSA flood laminae top several cms thick; thick and thin bedded; both leached and unleached laminae; abrupt wavy.
270-360	ACgb	N 2/0 - 3/0; silty clay loam; massive; sticky; few fine roots and organic matter; gleyed; historic dated wood at 350cm; leached.

SITE NAME: Trench 9, Pump station #1 area, Swan Lake HREP

GEOMORPHIC SURFACE: Late Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 215cm.

SLOPE: 0-2%

VEGETATION: Silver maples.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 230cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: PSA laminae to 70cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-70	C	10YR 2/2; silt loam, loam and silty clay loam; massive; PSA flood laminae; few fine roots and root holes; few sand laminae; both leached and unleached laminae; abrupt smooth.
70-95	Ab	10YR 2/1; silt loam; moderate medium subangular blocky breaking to moderate medium granular; friable; common fine root holes; leached; clear wavy.
95-120	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; leached; clear wavy.
120-145	Ab2	10YR 3/2; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; few medium Fe concretions; leached gradual smooth.
145-185	BCb2	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; leached; clear wavy.
185-230	Cgb2	10YR 4/2; silt loam; massive; friable to sticky; many medium distinct mottles; common medium Fe concretions; gleying; leached.

SITE NAME: Trench 10, Borrow area E, Swan Lake HREP

GEOMORPHIC SURFACE: Early to mid Holocene surface.

POSITION IN LANDSCAPE: Flat lying.

PARENT MATERIALS: Illinois River alluvium.

WATER TABLE: 220cm.

SLOPE: 0-2%

VEGETATION: ag field.

METHODOLOGY: Backhoe trench.

DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 230cm

DATE DESCRIBED: 10/12/1994

DESCRIBED BY: Jeff Anderson

REMARKS: No significant PSA, a late Holocene soil overlies an older early to mid Holocene soil. Contact is at about 80cm.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-20	Ap	10YR 2/2; silt loam; weak medium granular; friable; common fine root holes; some PSA mixed in with the Ap horizon; leached; abrupt smooth.
20-50	A	N 2/0; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; leached; clear wavy.
50-80	Bg	10YR 4/1; silt loam; moderate medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; few argillans down channels; common medium Fe concretions; leached; clear wavy.
80-115	ABtgb	10YR 3/1 - 2/2; silt loam; moderate medium subangular blocky; friable; many fine root holes; common medium distinct mottles; few medium Fe concretions; leached gradual smooth.
115-165	BCgb	10YR 4/1; silt loam; weak medium subangular blocky; friable; many fine root holes and fine roots; common medium distinct mottles; common Fe concretions; gleying; coarsening with depth; leached; gradual smooth.
165-230	Cb	10YR 4/4; loam and sandy loam; massive to single grained; friable to sticky; many medium distinct mottles; common medium Fe concretions; gleying; leached.

SITE NAME: Bank Exposure 1 Swan Lake HREP
 GEOMORPHIC SURFACE: Late Holocene surface.
 POSITION IN LANDSCAPE: Flat lying.
 PARENT MATERIALS: Illinois River alluvium.
 WATER TABLE: At base of exposure.
 SLOPE: 0-2%
 VEGETATION: Silver maples.
 METHODOLOGY: Bank exposure.
 DEPTH OF CORE, TRENCH, BORING, OR SOIL PIT: 200cm
 DATE DESCRIBED: 10/11/1994
 DESCRIBED BY: Jeff Anderson
 REMARKS: PSA laminae to 65cm, below lies a late Holocene soil.

DEPTH CM	SOIL HORIZON OR DEPOSITIONAL UNIT	DESCRIPTION
0-65	C	10YR 6/4 - 4/4; silt loam and loam; weak medium platy to massive; firm to hard dry; PSA flood laminae; few fine roots and root holes; both leached and unleached laminae; abrupt smooth.
65-95	Ab	10YR 3/3; silt loam; moderate medium subangular blocky; firm to hard dry; common to many fine root and worm holes; leached; clear wavy.
95-150	Bwb	10YR 4/3; silt loam; moderate medium subangular blocky; friable; many fine root and worm holes; common medium distinct mottles; few medium Fe concretions; leached; gradual smooth.
150-200	BCgb	10YR 4/1: silt loam; weak medium subangular blocky to massive; sticky; common medium distinct mottles; common medium Fe concretions; gleying; leached.

APPENDIX C
CORRESPONDENCE



DEPARTMENT OF THE ARMY

ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

23 FEB 1995

Planning Division
Environmental Planning Branch

Ms. Anne E. Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Ms. Haaker:

We have received your letter of February 9, 1995 concurring with the results of our Phase I survey and our determination of a conditional no adverse effect upon significant historic properties as a result of the Swan Lake Habitat Rehabilitation and Enhancement Project, Calhoun County, Illinois (IHPA LOG# 940322009M-C). In accordance with 36 CFR Part 800.9 (C)(1), there will be no adverse effect upon significant historic properties because of the following mitigation measures: 1) mitigation of site 11-C-152 (Persimmon Site), 2) avoidance of site 11-C-212, and 3) monitoring construction excavation of buried soil surfaces at the pump station #2 eastern channel. No human remains have been found in the project area.

Enclosed, for your review and concurrence, is our mitigation plan (scope of work) for Phase III investigations at site 11-C-152 (Persimmon Site). The scope was discussed and revised in telephone conversations between Mr. Joseph S. Phillippe of your staff and Ms. Suzanne E. Harris of my staff on February 3 and 6, 1995. A copy of this letter, along with all relevant project documentation and Phase I report, is being forwarded to the Advisory Council on Historic Preservation for their concurrence. If you have any questions, please contact Ms. Harris at (314) 331-8580.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosure



Illinois Historic Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

CALHOUN COUNTY
Swan Lake Habitat Rehabilitation
OLD LOG #920723003C-C
and Enhancement Project

PLEASE REFER TO:
IHPA LOG #940322009M-C
ARG 95 acres 2 sites

February 9, 1995

Ms. Suzanne Harris
US Army Corps of Engineers, St Louis Dst
PDAE Section
1222 Spruce Street
St. Louis, Missouri 63103-2833

Gentlemen:

Thank you for submitting the results of the archaeological reconnaissance. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

Our staff has reviewed the archaeological Phase I reconnaissance report performed for the project referenced above.

The Phase I survey and assessment of the archaeological resources appear to be adequate. We concur with your determination of a conditional no adverse effect upon significant historic properties as a result of the Swan Lake HREP, contingent upon 1) mitigation of site 11-C-152, 2) avoidance of site 11-C-212, prehistoric component, and monitoring construction excavation of buried soil surfaces at the pump station #1 western channel and the pump station #2 eastern channel.

If you have any questions, please contact Joseph S. Phillippe, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:MEE



DEPARTMENT OF THE ARMY

ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

Planning Division
Environmental Planning Branch

Mr. Joseph S. Phillippe
Illinois Historic Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Mr. Phillippe:

Pursuant to the National Historic Preservation Act, Section 106 (as amended), and its implementing regulation 36CFR800, the St. Louis District, U.S. Army Corps of Engineers, hereby provides the Illinois State Historic Preservation Officer with a copy of the following draft report for review: "A Phase I Archaeological Survey for Historic Properties within the Swan Lake, Habitat Rehabilitation Project (HREP), Environmental Management Program (EMP), Pool 26, Illinois River, Calhoun County, Illinois" by Steve Titus, W. Gordon Howe, Wes Neal and Jeffrey D. Anderson, American Resources Group, Ltd., Carbondale, Illinois (IHPA LOG #940322009M-C). The Phase I survey and subsequent project modifications address the concerns raised by you office during our telephone conversation on October 5, 1994.

The report describes the results of a Phase I archaeological survey of areas where construction is planned for a low riverside (exterior) levee, one interior closure, five borrow areas and one borrow trench, one lower closure between Swan Lake and the Illinois River, one drainage swale, one relocated road, three pump stations with channels and control structures, one pump station access road, and two boat ramps with parking lots and access roads. Subsequently, the following project modifications have been made: 1) borrow depths will be no more than 76 cm deep due to the high water table, 2) Borrow Area E has been eliminated, 3) the borrow channel along the eastern edge of Swan Lake will be no deeper than the base of the recent sediments (about elevation 414 feet above sea level).

The initial Phase I survey including geomorphological investigation was conducted October 10 - 14, 1994; additional Phase I backhoe testing of buried soils identified during the geomorphological investigations was conducted October 25 - 27, 1994. All terrestrial construction areas (totalling about 95 acres) were surveyed, except as noted below. Project elements to be constructed in the lake using recent (post 1904) sediments

were not surveyed including the interior closures, island groups and borrow trench along the lake edge. Although outside the project area, portions of the Illinois River shoreline where early eighteenth-century French artifacts have been reportedly found were also examined (with negative results).

The geomorphological investigations (soil coring, backhoe trenching and cutbank examining) were conducted to determine the relative ages of land surfaces within the project area and to evaluate the potential of those surfaces for containing cultural resources. Three radiocarbon dates were obtained. Buried soil surfaces so identified at accessible construction locations were then investigated for cultural resources using backhoe trenches and soil column.

Two archaeological sites, 11-C-152 and 11-C-212, were investigated. Site 11-C-23, which our records check with—your office indicated was located in our project area, is actually located a mile to the north and outside our project area.

Site 11-C-152, the Persimmon site, is a multicomponent Woodland site recorded previously. The southwest end of the site extends into the Pump Station #3 construction zone. The site has yielded diagnostic artifacts and a midden remnant; features may present. Therefore, the Persimmon site has been evaluated as eligible for the National Register of Historic Places.

Site 11-C-212 is a buried site containing both prehistoric and historic components, recorded in Borrow Area D. The prehistoric component consists of only two artifacts, a small Early Woodland sherd and an angular chert fragment located below 115 cm of recent silt. The prehistoric artifacts are confined to the extreme northeast corner of the Borrow Area D, so this component probably extends beyond the borrow area. The historic component is interpreted as a late nineteenth-century rural farmstead and associated discard area consisting of a limestone foundation, chinking (?), and a thin artifact scatter. Like the prehistoric material, the densest part of the historic component, including the foundation, is in the northeast corner of Borrow Area D. The historic component extends from 60 - 140 cm BS and may have disturbed the prehistoric component.

Results of the archaeological and geomorphological investigations indicate that significant historic properties will not be impacted at the following portions of the project:

- 1) Construction impacts will not extend below recent alluvium within most of the project area including the exterior levee from 0+00 to 482+50, Borrow Area A, Pump Stations #1 and #2

(see channels, below), and the two boat ramps with parking lots.

2) Construction impacts will extend below recent alluvium into poorly drained soil unsuitable for prehistoric or historic occupation at the extreme northern end of the exterior levee and at both boat ramp access roads (which were previously disturbed).

3) Construction impacts will extend below recent alluvium, but intensive investigation did not locate any cultural resources in Borrow Areas B and C or the Pump Station #3 access road.

4) Borrow Area E has now been deleted from the project. A buried soil surface with low potential for significant historic properties was identified at 80 cm below surface, but was not further investigated.

At locations of potential impacts to significant historic properties, the following avoidance/mitigation strategies are planned:

1) The Persimmon site (11-C-152), located at the Pump Station #3 construction area, has been evaluated as eligible by the St. Louis District. The Illinois Historic Preservation Agency concurred with this determination during our meeting in Springfield on November 14, 1994. The St. Louis District will be preparing a Phase III mitigation plan and submitting it to your office shortly.

2) Concerning site 11-C-212 in Borrow Area D, the prehistoric component has been determined potentially eligible by the St. Louis District, but the historic component has been determined ineligible because of its relatively recent age and questionable integrity. The prehistoric component will be avoided by removing a 3,000 square meter area from the northeast corner of Borrow Area D. Therefore, no further work on the prehistoric component is planned.

3) Buried soil surfaces with some potential for significant historic properties were identified at the Pump Station #1 western channel (to Swan Lake) and the Pump Station #2 eastern channel (to the Illinois River). These locations were inaccessible to a backhoe for further testing during Phase I. Therefore, construction of these channels will be monitored by an archaeologist.

Based on the findings of the draft report, the St. Louis District has determined a conditional no adverse effect upon significant historic properties as a result of the Swan Lake HREP, contingent upon 1) mitigation of site 11-C-152,

2) avoidance of site 11-C-212, prehistoric component, and
3) monitoring construction excavation of buried soil surfaces at the Pump Station #1 western channel and the Pump Station #2 eastern channel. The St. Louis District requests the concurrence of the Illinois State Historic Preservation Officer in these determinations.

If you have any questions, please contact Ms. Suzanne E. Harris of my staff at 314-331-8467.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosure

NOV 3 1994

Planning Division
Environmental Planning Branch

Ms. Susan Mogerman
Director, Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62701

Dear Ms. Mogerman:

This letter is to request your assistance in expediting our compliance with the National Historic Preservation Act of 1966, as amended, at one potentially eligible prehistoric site (11CT152) which will be impacted by construction of the Swan Lake Habitat Rehabilitation and Enhancement Project (HREP), Environmental Management Program (EMP), located in Pool 26, Illinois River, Calhoun County, Illinois. The Swan Lake project is located on Corps of Engineers property which is managed by the Illinois Department of Conservation and the U.S. Fish and Wildlife Service. The Swan Lake project involves constructing a riverside levee, an interior levee, three pumping systems with water control structures and lake dredging (plans attached). The purpose is to improve wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation and improving water level control in the three lake units.

My staff has coordinated with your office frequently since the Swan Lake project's early stages in 1990. The most recent contact was a telephone conference call involving personnel of the St. Louis District, the American Resources Group, Ltd. (ARG) and the Illinois Historic Preservation Agency on October 5, 1994, preceding the Phase I survey.

I am enclosing a short letter report presenting the results of our Phase I historic properties survey conducted by the ARG at the previously reported prehistoric Persimmon site (11CT152). A portion of the site lies within the construction area of the proposed Pump Station #3 at the Swan Lake project's downstream end. Our archaeological and geomorphological investigations at the site indicate that intact cultural deposits are present in the project area, but are not really extensive. On the basis of these deposits, the St. Louis District has determined the site to be potentially eligible for listing on the National Register of Historic Places. However, much of the site within the project

area has been destroyed by erosion of an outer bend of the Illinois River. The investigators have estimated that up to 50 miles of shoreline have eroded away.

Parenthetically, please note that our investigations found absolutely no evidence of the 1680 Tamaroa Indian massacre or of any other Historic Indian occupation at the Persimmon Site or elsewhere in our project. The possibility of such remains here or elsewhere within the Swan Lake project area was a major concern of your staff during our telephone conference call on October 5, 1994. I am enclosing a preliminary study indicating that the massacre occurred more than a half mile downstream from our project area.

Because the Swan Lake project is located within a national wildlife refuge and a state wildlife management area, we must follow a construction schedule which enables us to comply with requirements of the Fish and Wildlife Coordination Act of 1958, as amended, the Endangered Species Act of 1973, as amended, and the Clean Water Act of 1973, Section 404, as amended. Requirements of these laws prohibit construction during much of the usual construction season.

In order to comply with that construction schedule, we are proposing to move to extensive Phase II testing at the Persimmon site as quickly as possible. To that end, we and our contractor (ARG) would like to meet with your staff at your earliest convenience in your Springfield offices and/or at the site itself. We wish to discuss our Phase I investigations, the condition of the site and plans for Phase II testing.

It is our intention to comply with the National Historic Preservation Act as well as the environmental laws cited above. However, I request your assistance in expediting our activities at the Persimmon site. Your help in this matter is greatly appreciated. If you have any questions, please contact Ms. Suzanne E. Harris of my staff at (314) 331-8467.

Sincerely,

Signed
THOMAS C. SUERMANN
Colonel, EN
Thomas C. Suermann
Colonel, U.S. Army
District Engineer

Enclosures



Illinois Historic Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

CALHOUN COUNTY
Swan Lake Habitat Rehabilitation
OLD LOG #920723003C-C
and Enhancement Project

PLEASE REFER TO:
IHPA LOG #940322009M-C

July 26, 1994

Ms. Suzanne Harris
US Army Corps of Engineers, St Louis Dst
PDAE Section
1222 Spruce Street
St. Louis, Missouri 63103-2833

Gentlemen:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

We have reviewed the scope of work for the Phase I archaeological survey of the Proposed Swan Lake Habitat Rehabilitation and Enhancement Project (HREP), Environmental Management Program (EMP), located between Illinois River Miles 5-13, Calhoun County, Illinois, and would like to make the following comments:

1. We are concerned about the potential for locating the 1680 Tamora Indian massacre site thought to be in this general area and/or later period historic Indian village site or sites within the proposed project area. We request that you include provisions for a formal meeting between the contractor's archaeologist, our staff, yourself, and interested parties such as Hal Hassen, Illinois Department of Conservation Archaeologist, and regional archaeologists Ken Farnsworth, Center for American Archaeology, prior to the beginning of archival and field investigations.
2. The geomorphological work does not appear to allow for laboratory analysis nor Carbon 14 dating of samples. We feel that provision for this added work needs to be made.
3. We understand that you have already contacted Dr. Esarey, of our staff and discussed our mutual concerns about the potential for locating historic Indian materials that might create a need for NAGPRA consultations. We appreciate your comments and look forward to consulting with you on this potentially sensitive issue.

Should you have any questions, please contact Joseph S. Phillippe, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:JSP



Illinois Historic Preservation Agency

Old State Capitol • Springfield, Illinois 62701 • (217) 782-4836

217/785-4997

CALHOUN COUNTY
Swan Lake Habitat Rehabilitation
OLD LOG #920723003C-C (now deleted)
and Enhancement Project

PLEASE REFER TO:
IHPA LOG #940322009M-C

May 9, 1994

Ms. Suzanne Harris
US Army Corps of Engineers, St Louis Dst
PDAE Section
1222 Spruce Street
St. Louis, Missouri 63103-2833

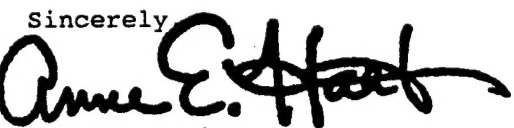
Dear Ms. Harris:

Thank you for requesting information regarding archaeological sites and previous archaeological investigations located within the selected sections of the Fuller Lake State Fish and Waterfowl Management Area and part of the Calhoun Division, of the Brussels District of the Mark Twain National Wildlife Refuge, and the watershed adjacent to the lake's west shore. There is only one previously recorded archaeological site (Site 11-C-23) within the proposed project area. Site 11C23 was reported by McGregor in the 1950's as a Hopewell mound and village site and is clearly significant if still intact. In addition, there has been only one professional archaeological report (IHPA Doc #814) of a portion of the above referenced area. Document 814 was a documentary search only with no actual field reconnaissance.

McNerny, Michael J. 1978 An Archaeological Survey of Selected Divisions of the Mark Twain National Wildlife Refuge in Iowa, Missouri, and Illinois. Prepared by Fisher Stein Associates, Carbondale, for Stanley Consultants, Inc. Muscatine, and the United States Fish and Wildlife Service Region 3.

Should you need copies of this report please contact our office. If you require any more information please contact Dr. Mark E. Esarey, Staff Compliance Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/7854998.

Sincerely


Anne E. Haaker
Deputy State Historic Preservation Officer

AEH:MEE

Enclosure: map and site form.



DEPARTMENT OF THE ARMY

ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF

March 21, 1994

Environmental Planning Section
Planning Division

Dr. Mark Esarey
Illinois Historic Preservation
Agency
Old State Capitol
Springfield, Illinois 62701

Dear Dr. Esarey:

The St. Louis District, U.S. Army Corps of Engineers, is in the plans and specifications stage of the Swan Lake Habitat Rehabilitation and Enhancement Project (HREP), Environmental Management Program (EMP), located in Pool 26 between Illinois River miles 5-13, Calhoun County, Illinois (Map 1) (IHPA LOG# 920723003C-C). The Swan Lake HREP includes the Fuller Lake State Fish and Waterfowl Management Area (Illinois Department of Conservation) and part of the Calhoun Division of the Brussels District of the Mark Twain National Wildlife Refuge (U.S. Fish and Wildlife Service) and the watershed adjacent to the lake's west shore. The project purpose is to restore wetland and aquatic habitats for waterfowl and fish by decreasing sedimentation, improving water level control, and decreasing wind generated waves. The project will involve construction of riverside and interior levees, construction of water control structures and pumps in the levees, construction of boat ramps, construction of two island groups, and dredging, (Map 2). Construction of about 250 sediment basins in the adjacent upland is planned as a second (upland) stage of this project. Locations for these basins will not be selected until after the (lowland) stage construction is completed.

We request any information which your records contain on reported archaeological sites or previous investigations within the lowland project area. The lowland project area is located in the following areas on the Brussels, ILL-MO and the Nutwood, ILL 7.5 minute topographic maps:

T13S R1W sec. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
T12S R1W sec. 7, 18, 19, 30, 31, 32
T12S R2W sec. 1, 12, 13, 24, 25, 36

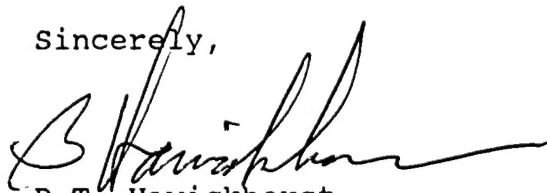
We will coordinate with your office on the upland sediment basins (private land) when the number and general locations of such basins have been determined.

A geomorphological study predicting potential archaeological site occurrence on various landforms in the Illinois valley (St. Louis District Historic Properties Management Report No. 34), suggests high potential along the river's natural levee and western shore, but low potential in the backswamp. The FWS has 13 sites recorded in their portion of the project are, according to Ms. K.L. Drews, Refuge Manager. We are inclosing a copy of a letter to the Refuge from the Center for American Archaeology, Kampsville referring to 1680 Tamaroa Massacre which may have occurred in the vicinity of the lake. Does your office have any additional information on the location of the massacre?

During the earlier stage of this project the St. Louis District, at the request of your agency, prepared a draft programmatic agreement (PA) for the Swan Lake HREP, which was subsequently expanded to a PA covering all District EMP projects in Illinois. Under the PA, the District would have initiated field work when funding became available during the construction phase. However, during a meeting between representatives of the District and your office in March, 1993, it was agreed to drop the PA and proceed with Phase I survey for Swan and the other EMP projects then planned. Due to the Great Flood of 1993, which inundated the Illinois valley for several months, we have not been able to proceed until now.

We will soon consult with your office concerning where Phase I survey for historic properties is warranted and the scope of work. If you have any questions, please contact Ms. Suzanne E. Harris of my staff, at (314) 331-8467.

Sincerely,



B.T. Hawickhorst
Acting Chief, Planning Division

Enclosures